British Non-Marine Mollusca.

E. W. SWANTON.

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A POCKET GUIDE

TO THE BRITISH

Non-Marine Mollusca

(including fossil forms which occur
in the Post-Pliocene Deposits,
excepting the Forest Bed Series)

BY

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LOCKWOOD:
CHARLES MOSLEY, 213, LOCKWOOD ROAD
1906

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PREFACE

THE 'List of British Non-Marine Mollusca,' recently published by the Conchological Society enumerates 170 species and 439 varieties. Ten species are aliens, and sixteen occur only in a fossil state. Descriptions of many of the latter are to be found only in the proceedings of various societies, in scientific magazines, and expensive books not easily obtainable. It is hoped this MANUAL, in bringing together descriptions of all the species and varieties, will prove useful to shell collectors. The number which follows the name of a species indicates the extent of its range as given in the latest Census List of the Conchological Society. Aliens are printed in small, and fossil forms in italic type.

I have much pleasure in thanking the following conchologists for help received. Messrs. Adams, Allchin, Collinge, Hobson, Hoyle, Wallis Kew, Santer Kennard, Oldham, Edgar Smith, R. Standen, and B. B. Woodward, for kind replies to queries; Messrs. G. W. Chaster, J. R. le Brockton-Tomlin, F. Taylor, and the Rev. R. Ashington Bullen, for kind gifts and loans of specimens; my thanks are specially due to Mr. Charles Pannell, of Haslemere, for loan of specimens and many books.

E. W. SWANTON.

HASLEMERE. May, 1906.

BRITISH
NON-MARINE MOLLUSCA.

TESTACELLA MAUGEI Férussac. 10

Shell very convex, oblong, in length one-sixth that of the extended animal, with a terminal spire of about 1¼ whorls. Periostracum, brown. Lines of growth strong, but variable and irregular. Length, 15 mill.; breadth, 7 mill.; height, 4 mill. Animal elongate, attenuated in front, very tumid behind, shortly cylindrical when at rest; ground colour varying from greyish-white to black, generally earthy-brown; with deep brown specks. The deeply incised lateral furrows are much wider apart at their origin (peripallial furrow) than in T. haliotidea. Mantle sparingly spotted. The large, convex, semi-cylindrical shell, and the interspaces between the lateral grooves at the peripallial furrow, are external characteristics which suffice to distinguish easily this species from its allies.

HABITAT. Market gardens and nurseries, in the south-west of England.

v. **viridans** Morelet: Animal greenish-brown, bronze-like; ventral disc bright orange-red.

TESTACELLA HALIOTIDEA Drap. 23

Shell convexly ear-shaped, thick, solid. Periostracum brownish, and, like that of the preceeding species, is often abraded from the more exposed parts of the shell. Length, 8 mill.; breadth, 5·5 mill.; height, 2 mill. Animal capable of great extension, sometimes as much as 120 mill., lenticular when at rest, ground colour greyish-white, sometimes yellow or greenish-brown, sprinkled with pale brown specks. The very narrow interspace (about 2 mill.) between the lateral grooves at the peripallial furrow, the whitish colour of the animal, and the smaller shell are the characteristic features of this species.

HABITAT.—Market gardens and nurseries in the south and west of England. Has also been recorded from Scotland S., Ireland S. and E., and Wales S.

v. **flavescens** Moquin-Tandon: Animal uniformly bright canary colour, in strong contrast to the brown shell. ('J. C.', Jan., 1905.)

TESTACELLA SCUTULUM Sowerby. 11

Shell narrowly ear-shaped. Periostracum rusty brown, more persistent than in the preceding species. Length 7 mill.; max. width 4 mill.; height 1·5 mill. Animal tawny yellow, with sole and foot-fringe orange-red, more or less sprinkled with brown on the back, of semi-globose form when at rest. The common origin of the lateral grooves, a little in advance of the peripallial furrow (in front of the shell), and the yellow colour of the body are features which easily distinguish this slug from its congeners.

HABITAT. Market gardens and fields in the vicinity of human dwellings. It is more widely distributed in England than its allies.

v. **albina** Gassies & Fischer: Animal yellowish or whitish. (J. Maddison, in 'J. C.', Oct., 1904.)

LIMAX MAXIMUS Linné. 88

Shell beneath the hinder part of the shield, thin, whitish, slightly convex above, concave below. Length 13 mill.; breadth 7 mill. Animal long and slender, sometimes 150 to 200 mill. in length. Keel confined to the vicinity of the tail. Body colour varying from ashy-grey to black, sometimes unicolorous, but more frequently banded or spotted with black. Sole uniformly pale. The animal at once rises up and almost inverts the mantle if it is touched in front. The longer and more slender tentacles and the spotted shield distinguish this species from L. arborum.

HABITAT. Cellars and gardens, woods and hedgerows. Usually in the neighbourhood of human dwellings, excepting in Ireland where it is generally restricted to woods and other isolated places.

v. **cinereo-niger** Wolf: Tentacles shorter and stouter, rugæ coarse and prominent, keel very pronounced extending half the length of the body. Ground colour uniformly darker, shield unicolorous. Sole divided into three longitudinal black and white lines of which the middle one is white. (= ? hedleyi Collinge)

v. **ferrusaci** Moquin-Tandon: Animal ashy-grey, mantle with small round black spots, body with two or three rows of similar spots on each side.

v. **krynickii** Kalaleniczenko: Animal ash-coloured, paler on back, with black spots, and two black bands. Mantle spotted. (= v. johnstoni Moquin-Tandon.)

v. **fasciata** Moquin-Tandon: Animal pale ash colour, with three dark bands on each side. Mantle either spotted or streaked.

v. **maculata** Picard: Animal ash colour with irregular, distinctly detached and rounded black spots on the mantle and back.

v. **rufescens** Moquin-Tandon: Animal reddish, unicolor.

v. **cellaria** D'Argenville: Animal ash colour, mantle spotted with black, body with longitudinal lines of the same colour, but interrupted, presenting alternate lines and points.

v. **candida** Lessona and Pollonera: Animal pure white and somewhat transparent. Eyes pale brown.

LIMAX TENELLUS Müller. 8

Shell oblong or oval, whitish, thin, and nearly transparent, slightly concave beneath. Length 3·5 mill.; breadth 2 mill. Animal very soft and sticky, slender, 25 to 38 mill. in length. Body colour pale yellowish or greenish-white, shield orange. Obscurely banded on each side of the shield and body. Slime yellow. Since Mr. Blacklock's discovery of this species in Durham co. in 1853 (it is figured in Forbes & Hanley's 'British Mollusca'), doubts have been cast upon its authenticity, and it does not find a place in the official list of Brit. L. & F. Moll., published by the Conch. Soc. early in 1904. It has been recently re-established as a British species by Mr. Denison Roebuck ('J. C.', Oct., 1904), who writes "The species is an unmistakable one when carefully examined, owing to its yellow body slime, its black tentacles, and the very black and broad parallel retractor-muscles seen on the neck.

It cannot be confounded with any other Limax; the only slug it can be really mistaken for in the field is Arion subfuscus, which it resembles somewhat in outward aspect."

HABITAT. The pine woods of the Forest of Rothiemurchus in the vice-county of Easterness and other localities in Scotland, also Durham and S. W. Yorkshire. It should be looked for in ancient pine forests in autumn, when fungi are prevalent.

- v. **cerea** Held: Lighter, very yellow and wax-like.
- v. **fulva** Normand: Darker in colour, with but little slime.

LIMAX FLAVUS Linné. 52

LIMAX VARIEGATA Dráparnaud.

Shell oblong or quadrangular, thin, white, concave above, convex below. Length 9 mill.; breadth 6 mill. Animal with a long and somewhat stout body, in length varying from 75 to 105 mill. when extended. Body colour dark amber-yellow, tesselated with blackish-brown and white. Slime thin, light yellow. The bluish tentacles, yellow, mottled shield, and the oval, yellowish rugæ scattered over the body are features which specially distinguish it from allied species.

HABITAT. Cellars and damp places in the vicinity of human dwellings, also moist woods. A gregarious species with a predilection for cryptogamic plants.

- v. **virescens** Moquin-Tandon: Animal almost completely greenish, markings indistinct.
- v. **suffusa** Roebuck: Animal entirely of an uniform dark or grey colour.

- v. **rufescens** Moquin-Tandon: Animal reddish with indistinct markings.
- v. **maculata** Kalaleniczenko: Animal ochreous yellow or brown, with dark-grey or blackish markings.

LIMAX ARBORUM Bouchard-Chantereaux. 56

= LIMAX MARGINATUS Müller.

Shell oval, slightly convex, very white and glistening above. In size and substance very variable. Length 4 to 7 mill.; width 2·75 mill. Animal with a moderately long and slender body about 75 to 80 mill. in length. Body cinerous, sometimes yellowish, reddish, or even black, with a dusky longitudinal dark band on each side; keeled near the tail. Shield somewhat acutely pointed behind, with a lyre-shaped black band on each side. Slime colourless and very shining. The very soft and gelatinous body readily separates this slug from other Limaces. It differs from young L. maximus in the lateral banding of the shield, and inability to raise and reflect the fore part of the mantle when touched.

HABITAT. Woods, especially beech, but also other trees, which it frequents for the cryptogamic plants upon them.

- v. **nemorosa** Baudon: Ground colour rosy-white or reddish-grey, tinged with brown; shield reddish-brown, the dark-brown or black lateral bands do not extend beyond the anterior third of its length.
- v. **bettonii** Sordelli: Inner and main bands fused, but broken up by pale irregular spots. Shield with lateral bands, and a median brownish zone.

v. **maculata** Roebuck: Animal pale with numerous small black spots. There are slender lateral bands which dispay a tendency to become maculate.

v. **rupicola** Lessona and Pollonera: Deep brown or almost black, smaller than type, with a well-developed keel extending nearly two-thirds the length of the back. In mountainous districts.

v. **pallens** Lessona & Pollonera: Body colour yellowish, a pale dorsal line extends for two-thirds the length of the keel. The shield is very faintly banded.

v. **alpestris** Lessona & Pollonera: Smaller than type, with a well-developed keel extending almost a quarter the length of the back. Dark colour, with a paler dorsal line. Shield blackish, obscurely banded. In mountainous districts.

AGRIOLIMAX AGRESTIS Linné. 125

Shell oval, convex above, concave below, white, thin, and rugose. Length 4 mill.; width 2·25 mill. Animal generally cream-colour or yellowish, (sometimes lavender-colour, or even totally purple-black), speckled with brown or black spots. Mantle large, concentrically striate, more than one-third the length of the animal. Length about 35 mill. Slime clear, milky-white on irritation. The milk-white slime and the whitish body usually, blotched with dark spots, at once suffice to distinguish this species.

HABITAT. Widely distributed in forest, moor, and marsh, though with a predilection for the vicinity of human habitations. A well-known garden pest.

- v. **sylvatica** Moquin-Tandon: Body colour variable (head often a clear brown) with irregular spots.
- v. **punctata** Picard: Animal greyish or white, with very small black spots.
- v. **nigra** Morelet: Animal entirely jet black or bluish-black with a pale sole.
- v. **lilacina** Moquin-Tandon: Animal purple, lilac, or slate-coloured, spotless.
- v. **albida** Picard: Animal greyish-white, spotless, shield sometimes yellowish.
- v. **reticulata** Moquin-Tandon: Animal red or reddish-grey, with irregular blackish spots.
- v. **tristis** Moquin-Tandon: Animal almost uniformly brown, sometimes with indications of lateral bands of deeper colour.
- v. **obscura** Moquin-Tandon: Reddish with brown spots (a form of v. reticulata).
- v. **rufescens** Lessona & Pollonera: Animal with rufous body coloration.

AGRIOLIMAX LÆVIS Müller. 50

Shell oblong-oval, convex above, concave below, white and glistening. Length 3 mill.; breadth 1·5 mill. Animal rather slender, very glossy and smooth, about 40 mill. in length: Uniformly reddish-brown colour. Tail keeled. Shield large, somewhat paler than body. The neck is very long, causing the shield to appear to occupy a central position. The slime is very copious, clear, and watery, becoming somewhat milky after continued irritation. The colourless mucus, long neck, red-brown colour, and very restless habits distinguish this species from its congener. HABITAT. Damp situations, usually in the vicinity of water. We have frequently found it in autumn in the stems of Russula fœtans and allied species of fungi.

No variation is recorded in the Society's list. The variety lacustris Bonelli, which differs from the type in being irregularly spotted with dark brown, occurs in the Punch Bowl, Hindhead, and other places in Surrey.

In Taylor's Monograph is recorded v. grisea Taylor, a greenish-grey variety with grey mid-sole and pale side areas, from a railway embankment in a marsh, Downpatrick, County Down.

MILAX SOWERBYI Férussac. 45

=AMALIA MARGINATA Müller.

Shell elliptical, glistening white, slightly convex above and concave below in immature specimens. Length 5 mill.; breadth 3 mill. Animal laterally compressed, length 75 mill. in fully extended adults. When contracted the height is but little less than the length; it then appears almost semicircular. Body colour greyish, somewhat yellowish from the presence of closely beset orange-coloured specks. Keel amber-colour, very prominent on the back, less so on the caudal extremity. Mantle elongated oval, about one-third the whole length of the animal, granulated. Slime thick, normally colourless, but of an orange tint when the animal is subjected to much irritation. The prominent dorsal keel, almost invariably of a lighter colour than the rest of the body, distinguishes this species from its congener.

HABITAT. Gardens and fields in their vicinity; gregarious, keeping several inches below the surface by day.

v. **carinata** Risso: Animal larger, and darker;

mantle longer; groove on mantle extending further forward than in the type.

v. **nigrescens** Roebuck. Body dark grey or nearly black, said to be often without an internal shell.

MILAX GAGATES Draparnaud. 39

AMALIA GAGATES Draparnaud.

Shell oval, rugose, glistening white in colour, length 4·5 mill.; breadth 3 mill. An almost flat calcareous plate on the underside of the shell causes it to appear, when viewed laterally, as if two shells were placed one upon the other. Animal somewhat slender, usually 50 mill. in length when extended, sometimes more. Dark red or lavender-colour (rarely black in this country), with a very prominent keel especially pronounced at the caudal end. Shield elongated oval, finely wrinkled. Slime glutinous, colourless normally, but pale yellow upon irritation. The greater uniformity of colour and the strongly prominent keel at the caudal extremity usually the same tint or darker than the body, distinguish this species from its congener. When at rest its height almost equals its length.

HABITAT. Heaps of decaying vegetable matter in gardens, and hedgerows in the vicinity of houses.

v. **plumbea** Moquin-Tandon: Animal greyish black, or more or less lead-coloured.

VITRINA PELLUCIDA Müller. 113

Shell glassy-green, thin, very glossy. Whorls three to four, the body whorl very large. Spire extremely short. Mouth somewhat oval. There is no umbilicus. Height about 2·2 mill.; breadth 6·3 mill. Shells that have been long exposed without the animal become milky-white. Animal elongated, body colour pinkish-grey, mantle marked with minute black spots; it is too large to be contained entirely within the shell.

HABITAT. Amongst moss, leaves, and herbage in woods and hedgerows. Active in winter.

v. **depressiuscula** Jeffreys: Shell flatter than type, somewhat oval. The spire scarcely raised above the level of the last whorl.

v. **dillwyni** Jeffreys: Shell almost globular, with a prominent spire. Last whorl very convex.

VITREA CRYSTALLINA Müller. 102

=HYALINIA CRYSTALLINA Müller.

Shell flattened, glassy, transparent. Whorls four and a half to five; the body whorl not much smaller than the penultimate. Sutures shallow but well-marked. Aperture crescent-shaped, almost as broad as high. Umbilicus small. Diameter 3 to 3·5 mill.; height 1·75 mill. Animal milk-white. Dorsal tentacles black, ventral pair greyish.

HABITAT. Woods and hedgerows, especially amongst dead leaves, and under stones.

v. **complanata** Jeffreys: Shell almost flat on both sides. The last whorl proportionately larger than the preceding one.

v. **contracta** Westerlund: Last whorl very narrow.

VITREA LUCIDA Draparnaud. 14

HYALINIA DRAPARNALDI Beck.

Shell slightly convex above, apex flat. Upper surface fawn-colour; bluish-white and semi-transparent below. Whorls six to seven, with fine transverse striæ. Last whorl rapidly enlarging towards the mouth, which is very oblique and oval. Umbilicus wide. Diameter 14 mill.; height 6 mill. Animal completely cobalt blue, even to the footsole. The back, head, and tentacles are somewhat darker than the rest of the body.

HABITAT. Amongst herbage and under stones in hedgerows. Very local.

v. **albina** Moquin-Tandon: Shell whitish.

VITREA CELLARIA Müller. 127

=HYALINIA CELLARIA Müller.

Shell flattened, spire very little raised. Dirty yellow or pale horn-colour. Upper surface rather transparent, under surface clouded with white, especially about the umbilicus. Whorls five to six. Mouth obliquely crescent-shaped, breadth little in excess of height. Umbilicus large, exposing the second whorl. Diameter 6 to 18 mill., height 4 mill. Animal dusky grey. The largest British representative of the family.

HABITAT. Under stones and about walls in damp situations. Occasionally occurs in damp cellars.

v. **complanata** Jeffreys: Shell small, spire flat.
v. **albina** Moquin-Tandon: Shell whitish.

m. **sinistrorsum** : Shell sinistral.

VITREA ROGERSI B. B. Woodward. 53

=HYALINIA GLABRA Auctt., and HELVETICA, Auctt.

Shell thin, very shining, and transparent. The lines of growth are almost obliterated, but may be seen under a powerful lens. Slightly convex above, somewhat flattened below. Waxy-brown or pale horn-colour, tinged milky-white in the region of the umbilicus. Whorls five, the last twice the diameter of the penultimate. Suture well defined, but not truly channelled. Aperture rounded-lunate. Umbilicus narrow and deep. Diameter 7·5 to 8·5 mill., height 4·5 mill. Animal dark bluish-grey, emitting at times a strong smell of garlic.

HABITAT. Under stones and amongst herbage in woods, fields, and hedgerows.

v. **viridans** Cockerell : Shell greenish-white.

VITREA ALLIARIA Miller. 106

=HYALINIA ALLIARIA Miller.

Shell depressed, flat, thin, transparent, greenish, streaked and shining. Pale amber or horn-colour, the lower surface not so white as in the preceding species. Whorls five, the last not so large in proportion to the others as in Hy. cellaria. Umbilicus moderately large, exposing the second whorl, aperture semi-lunar. Diameter 5 to 6 mill., height 3 mill. Animal dark grey, emitting a strong smell of garlic when irritated. The less-rounded aperture, smaller size, larger umbilicus, flatter underside, and duller appearance above, are external features which specially distinguish this shell from V. rogersi.

HABITAT. Walls, gardens and woods. Of more frequent occurrence on Neocomian strata than any other member of the genus.

v. **viridula** Jeffreys: Shell greenish-white.

VITREA NITIDULA Draparnaud. 120

HYALINIA NITIDULA Draparnaud.

Shell flattened (but the spire is more raised than in V. cellaria or V. alliaria), dull wax-colour above, paler below, clouded with opaque white in the region of the umbilicus. Whorls four to five, convex, with irregular striæ which are interrupted by the deepish sutures. Aperture semilunar, a little oblique. Umbilicus large, exposing the second whorl. Diameter 7 to 9 mill., height 2 mill. Animal dark lead-colour, with darker tubercles. The dis-continuation of the striæ from whorl to whorl is a feature which readily separates this shell from V. radiatula.

HABITAT. Amongst moss in sheltered glens, and under stones in hedgerows.

v. **nitens** Michaud: Shell small, lighter. Last whorl laterally expanded, somewhat larger in proportion to the others.

v. **helmi** Alder: Shell pearl-white.

VITREA PURA Alder. 89

=HYALINIA PURA Alder.

Shell depressed, spire very slightly raised, very pale amber or whitish, transparent and glossy. Whorls four, convex, body whorl much larger than the preceeding one. Sutures well-defined, deep, and narrow. Aperture roundish, oblique. Umbilicus narrow but deep, disclosing all the internal spire. Diameter 2·5 to 4 mill., height

1·5 mill. Animal dark grey, mottled with small black specks.

HABITAT. Under decaying leaves, moss, stones, and stumps of trees in woods, fields, and hedgerows.

v. **nitidosa** Gray : Shell pale horn-colour.

VITREA RADIATULA Alder. *78*

=HYALINIA RADIATULA Alder.

Shell flattened, transparent, shining, amber or deep horn-colour, without white opacity beneath. Whorls four to four-and-a-half, convex, body whorl very large in proportion to the rest. Striæ regular, extending from whorl to whorl, suture not very deep. Aperture crescent-shaped, broader than high. Umbilicus moderately deep. Diameter 2 to 4 mill., height 1·75 mill. Animal dark brown, tuberculated, with a few white spots between the tubercles. The extension of the striæ from whorl to whorl without interruption by the sutures distinguishes this species from V. nitidula. Immature V. nitida are occasionally mistaken for it, an error which can easily be avoided if attention is paid to the number of whorls—a mature nitida has five whorls, radiatula never more than four-and-a-half.

HABITAT. Grass and moss, also under stones and logs in woods; always in damp situations.

v. **viridiscenti-alba** Jeffreys : Shell greenish-white.

ZONITOIDES NITIDUS Müller. 57

HYALINIA NITIDA Müller.

Shell flattened, sub-globular, spire slightly more raised than in V. nitidula; glossy, semi-transparent, with transverse striæ. Brownish horn-colour, without any whiteness on the under surface. Whorls five, body whorl occupying half the shell. Aperture oblique, roundish, longer than broad. Umbilicus narrow and deep. Diameter 6 mill., height 3 mill. Animal bluish-black, causing the shell containing it to appear dark chocolate-brown in colour.

HABITAT. Always in damp situations, herbage in marshes, and on the margins of streams and ditches.

v. **albina** Moquin-Tandon : Shell whitish.

ZONITOIDES EXCAVATUS Bean. 43

=HYALINIA EXCAVATA, Bean.

Shell depressed, thin, sub-globular, shining, dark horn-colour, without white opacity on the under surface. Spire slightly produced. Upper surface strongly striated. Whorls five to five-and-a half, convex. Aperture rather small, lunate. Umbilicus large and deep, disclosing all the whorls. Diameter 5·75 to 6·25 mill., height 2.75 mill.

HABITAT. Decaying tree stumps, leaves, and moss, in woods.

v. **vitrina** Férussac : Shell greenish-white and transparent.

ZONITOIDES MINUSCULUS Binney.

Shell minute, convex, base rounded on the body whorl, thin, semi-transparent, greenish-white. Whorls four, compact, convex, suture very pronounced. Spire slightly raised, apex blunt. Aperture almost circular, lip thin, acute. Umbilicus large, but not exhibiting more than two volutions. Diameter 2 mill., height 1 mill.

HABITAT. Under sticks ,chips, and stumps, in damp situations on the margins of streams in the United States, Japan, and other countries. In Great Britain occurring only in hot houses at Nottingham, where it has been introduced amongst foreign plants.

EUCONULUS FULVUS Müller. 90

=HYALINIA FULVA Müller.

Shell conical, smooth, glossy, thin, dark horn-colour. Whorls five-and-a-half to six. Periphery bluntly keeled. Spire produced, apex blunt. Aperture crescent-shaped, narrow. Umbilicus shallow and ill-defined. Diameter 2·5 mill.; height 3 mill. "Beneath a very powerful lens the base of this shell exhibits most exquisitely fine spiral striolæ" (Forbes & Hanley). Animal grey.

HABITAT. Old walls and quarries, also beneath stones and logs in moist situations. The more humid the position, the finer the specimens.

v. **mortoni** Jeffreys: Spire depressed; less flattened below; peripheral keel sharper.

v. **alderi** Gray: Shell small, of darker colour. Spiral striolæ more distinct.

v. **viridula** Taylor: Shell transparent, greenish-white.

ARION ATER Linnè. 117

=ARION EMPIRICORUM Férussac.

Shell represented by a mass of loosely aggregated calcareous granules. Body convex above, contracted and rounded in front, attenuated behind, covered with large, keeled, and elongated rugæ. Colour very variable, various shades of black, brown, red, and yellow.* Tentacles black, strongly granulated, bulbs much swollen. Sole, foot fringe, and lineoles variable. Slime yellowish. Length 48 to 120 mill. If adult specimens are tapped on the head they contract and arch the body, if tapped again they begin to sway from side to side in a peculiar manner.

HABITAT. Woods, hedgerows, gardens, and fields.

v. **rufa** Linnè. Animal uniformly red or brownish.

v. **flagella** Collinge. Length 50 mill. Head bluish-white; sides of the body and foot fringe light brownish-white. Sole pale yellow. A dark vandyke-brown band extends from the caudal gland to the mantle in the median line, and a band of similar colour borders a light brown band on each side intermediate between it and the median band. Rugæ oval, flattish, separated by deep sulci. (Found by Mr. Phillips in two stations in Co. Cork.)

v. **lusitanica** Mabille: Differs morphologically from the type in that it has only a single vestibule leading from the genital orifice.

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*Young specimens have well defined lateral bands and stripes. Such banding occurs in the young of all species of Arion, and is considered by Dr. Simroth as an ancestral character.

The retractor muscles are attached much lower down the oviduct, and quite close to the receptaculum. (Found by Mr. Burnley Rathborne at Bantry Bay, Ireland.)

The following so-called varieties are only colour forms of the type.

v. **brunnea** Roebuck: Colour of burnt sienna.

v. **plumbea** Roebuck: Uniformly pale lead colour.

v. **reticulata** Roebuck: Cream colour with grey interstices, hence appearing distinctly reticulated. Mantle uniformly grey, foot fringe pale. (Perhaps this should come under v. alba.)

v. **bicolor** Roebuck: Blackish-brown, with yellowish or orange sides.

v. **swammerdami** Kalaleniezenko: Footfringe varying from yellow to an orange-red.

v. **rubra** Baudon: Deep red, only a sub-variety of v. rufa.

v. **alba** Linnè: White to cream colour.

ARION SUBFUSCUS Draparnaud. 71

Shell represented by only a few isolated calcareous granules. Animal cylindrical, yellowish or greyish-yellow, but appearing reddish-brown or orange-red owing to the copious thick mucous which covers the mantle and back. Head and tentacles dark grey. Sole and foot-fringe white or yellowish, lineoles grey. Rugæ short and flat, sulci blue. Slime colourless.* Length 40 to 60 mill., breadth 6 to 10 mill.

HABITAT. Woods, hedgerows, and gardens. A common slug on the Lower Greensand.

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*The saffron-coloured mucous which stains the fingers on handling this slug is secreted by the mucous glands of the

v. **aurantiaca** Locard: Animal bright orange with indefinite lateral bands.

v. **brunnea** Lehmann: Animal uniformly brownish, bands obsolete.

ARION ELONGATUS Collinge. I

"Head and tentacles blackish, the later slightly lighter than the head. Centre of mantle marked with a pyriform mass of deep black, bounded on either side by a narrow yellowish-grey line, below by a deep black band which gradually shades off into a yellowish-grey. Whole of dorsal surface a deep black, bounded, like the mantle, by a yellowish-grey line, then a deep black band, which shades off into a yellowish-grey. Foot-fringe yellow, with sepia lineoles. Sole yellowish; lateral planes distinct from median plane, which latter is marked in a dendritic manner and slightly lighter in colour. Rugæ large and flat. Respiratory orifice distinct. Keel absent, the back being almost flat. Length alive 24 mill., length in alcohol 15 mill.; length of mantle in alcohol 5 mill. Externally the slug somewhat resembles certain young forms of A. empiricorum F., and forms of A. hortensis F., its structure, however, is very different.†"

HABITAT. This species, together with the vars. celtica and cottiana of A. hortensis, was found by the author under stones, tiles, and carnation plants on a lawn in Grosvenor Square, Southampton, July 1893. It displayed great activity,

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mantle and integument. It must be carefully distinguished from the true slime which is colourless.

†From the original description by Walter E. Collinge, M.Sc., in Annals and Mag. Nat. Hist., Ser. 6, Vol. xiii, Jan. 1894.

the flatness of the back when at rest was very remarkable.

ARION INTERMEDIUS Normand. 47

=ARION MINIMUS, Simroth.
=ARION FLAVUS, Moquin-Tandon.

Shell consisting of calcareous granules, usually isolated, but sometimes coalescing to form an irregular shell. Animal white, light yellow or yellowish-grey. Head and tentacles dark grey or blackish. Mantle granulated. Lateral bands faint or absent, there are also faint indications of banding on the mantle. Rugæ minutely pointed, arranged in longitudinal rows. The foot is white, but appears yellow owing to the slime. Length 20 to 23 mill., the smallest of our Arions. It assumes peculiar arched position (so well seen in A. ater) when at rest. The remarkable knob-like projection or conical spike on the apex of each ruga is very characteristic, and renders easy diagnosis from external appearances.

HABITAT. Woods, hedgerows, gardens, and fields. Often mistaken for immature A. ater. Widely distributed.

ARION HORTENSIS Férussac. 95

Shell consisting of granules cemented together into an oval mass. Body colour very variable—dark grey, light brown, bluish, or black. Altogether smaller and more slender than A. ater, with lateral bands usually much darker than the ground colour. The mantle has a band around its margins, and one in the median line. Head and tentacles dark greyish-blue. Sole reddish or yellowish-white. Rugæ close set, coarse, oblong. Length 24 to 37 mill.

HABITAT. Woods, hedges, and gardens. Very widely distributed. A well known garden pest.

v. **celtica** Pollonera: Described in 1887 as a distinct species.

"A. hortensis affinis: dorsum mediocriter rugosum; clypeus minute granulosus; olivaceo-nigricans, utrinque nigrozonatum, minutissime aureo-punctatum, lateribus pallidegriseis nigro variegatis; solea pallide-flava; pedis margo pallide flavus imperfecte griseo-lineolatus; caput et tentacula nigricantia. Mucus soleae et pedis aurantiacus. Long. max. 30 mill."

Specimens agreeing entirely with the above description were taken by the author at Doddington, Kent, and Southampton, Hants. (See Collinge's 'Review of the Arionidæ of the British Isles.')

v. **cottiana** Pollonera: Described in 1889 as a distinct species.

"A. hortensi proximus, a quo differt statura panlulum minore, dorso minus rugoso, solea subtiliore. A leviter rugosus, sordide griseus, medio fuscatus, lateraliter atrocastaneo zonatus et reticulatus. Solea subtilissima, pallida; margine externo angusto (flavo ?), postice nigro-punctulato, et sublineolato, ad glandulum caudalem nigrescente. Limacella nulla. Long. (in alcohol) 15 mill."

Specimens agreeing with the above description, collected by the author on a lawn in Grosvenor Square, Southampton, June 1893, were dissected by Dr. Simroth and W. E. Collinge, M.Sc. Average length of living animal 36 mill., in alcohol 25 mill. (See Collinge's 'Review of the Arionidæ.")

v. **cærulea** Collinge: Animal blue or greyish-blue, with dark blue lateral bands, pale yellow between the bands and the white foot fringe. Mantle dark blue in the centre with darker bands at each side. Length 43 mill., Hab.: Co. Dublin, Berks., Oxford, and S. Hants.

v. **rufescens** Moquin-Tandon : Animal reddish with prominent black lateral bands.

v. **subfusca** C. Pfeiffer: Animal orange with brown bands.

v. **nigra** Moquin-Tandon: Animal black or blackish, with or without lateral banding. (The last four varieties are possibly only colour forms of the type.)

ARION FASCIATUS Nilsson. 90

=ARION BOURGUIGNATI Mabille.
=ARION AMBIGUUS Pollonera.

Animal whitish-grey, yellow, or brown, lateral bands always darker than ground colour, and continued to the front of the mantle. Head and tentacles bluish. Sole and foot-fringe yellowish-white. Rugæ narrow. Keel well defined in young specimens, but becoming obsolete as the animal approaches maturity. Length 40 mill. Superficially resembling certain forms of A. hortensis, but morphologically distinct, e.g., the the elongated receptaculum seminis is quite unlike any other member of the genus in terminating in an attenuated apex. Like A. ater and A. minimus it assumes an arched or humped position when irritated.

HABITAT. Woods, gardens, and fields, especially the latter.

v. **circumscriptus** Johnston : Keel absent from the first, otherwise like type.

v. **subfusca** Roebuck : Brownish with dark bands. (Merely a colour form.)

GEOMALACUS MACULOSUS Allman. **2**

Shell solid, flat, unguiform, with concentric lines of growth. Animal glossy brown or blackish, spotted with yellow or cream coloured markings. The markings sometimes take the appearance of longitudinal bands. Sole light yellow. Head and tentacles dark grey. Discovered in 1842 by Mr. William Andrews "on rocks around Lough Carrough, to the south of Castlemain Bay, Co. Kerry, in the West of Ireland."

HABITAT. Dr. Scharff says it occurs among lichens. "The dark grey lichens with the white or yellowish fructification, conceal the slug perfectly, and there is no doubt that we have here a most striking instance of protective colouring."

PUNCTUM PYGMÆUM Draparnaud. 68

=HELIX PYGMÆA, Draparnaud.

Shell very minute, nearly circular, semi-transparent, thin, slightly striated: pale brown horn colour. Whorls four, convex. Spire slightly produced. Suture deep. Aperture crescent shaped. Umbilicus large and deep. Diameter 1·5 mill., height ·6 mill. Animal greyish or darkish-brown, with black specks. The smaller size (that of the head of an ordinary pin), fewer whorls, and more open umbilicus, are features which distinguish this species from P. rupestris which superficially resembles it.

HABITAT. Under stones, sticks, and leaves, also at the roots of grasses, especially in woods. Common.

SPHYRADIUM EDENTULUM Drap. 66

=VERTIGO EDENTULA Draparnaud.

Shell ovate, cylindrical, glossy, pale brown or horn-colour with the peristome paler, slightly transversely striated. Whorls five to six-and-a-half, gradually increasing in size. Spire conical, apex blunt. Suture moderately deep. Aperture semicircular, without denticles. Umbilicus narrow, fairly deep. Diameter 1·6 mill., height 2·6 mill. Animal greyish, with darker tentacles.

HABITAT. Under stones and sticks, and among moss in damp situations.

v. **columella** G. von Martens: Shell longer, maximum height 3·5 mill.; last whorl slightly broader than the preceding.

PYRAMIDULA RUPESTRIS Draparnaud. 53

=HELIX RUPESTRIS Draparnaud.

Shell sub-conical, somewhat glossy, depressed below. Marked transversely with strong oblique curved striæ. Colour blackish-brown, apex whitish in old specimens. Whorls five, rounded. Suture deep. Aperture almost circular. Umbilicus extremely large and deep. Diameter 3 to 3·25 mill., height 2·5 mill. Animal slaty-grey or dusky-red.

HABITAT. Old walls and castle ruins, usually in lofty exposed situations on limestone soils.

v. **trochoides** Kreglinger: Spire more produced, umbilicus narrower.

v. **viridescenti-alba** Jeffreys: Shell greenish-white.

PYRAMIDULA ROTUNDATA Müller. 132

=HELIX ROTUNDATA Müller.

Shell circular, depressed. Colour yellowish or reddish-grey, marked with brown and yellowish-grey spots arranged in a radiating manner. Whorls six to seven, suture moderately deep, periphery bluntly keeled. Spire slightly produced. Aperture semi-lunar, not reflected; in old specimens there is a white internal rib. Umbilicus large and deep, exposing the interior of all the whorls. Diameter 6·5 to 8 mill., height 3 mill. Animal slaty-grey, spotted with black.

HABITAT. Under stones, decaying logs, and leaves. On Greensand soils it is the commonest of the smaller Helices.

v. **turtoni** Fleming: Shell very depressed, almost flat above and below.

v. **pyramidalis** Jeffreys: Shell sub-conical, spire more raised.
v. **rufula** Moquin-Tandon: Shell tawny, and spotless.
v. **alba** Moquin-Tandon: Shell white or greenish white, spotless, transparent.
m. **sinistrorsum**: Shell sinistral.
m. **scalariforme**: Whorls disunited.

PYRAMIDULA RUDERATA Studer.
=Helix ruderata Studer.

Shell somewhat globular, thin, finely and regularly striated in the line of growth. Uniformly light brown or yellowish-horn colour. Whorls five, convex, rapidly enlarging, body whorl occupying about one half of the shell, not keeled, suture large. Spire produced, apex obtuse, usually lighter in colour than the rest of the shell. Aperture almost circular, thin. Umbilicus very large and deep. Diameter 5 to 6 mill., height 4 to 4·5 mill. Allied to P. rotundata, but differs in the produced spire, the entire absence of a keel, and the larger mouth.

HABITAT. *Beneath moss and sticks, usually in damp situations, in Germany, Holland, Sweden, etc. Extinct in Britain, occurring only in Pleistocene deposits at Barnwell, Copford, Clacton, Swanscombe, and West Wittering.*

EULOTA FRUTICUM Müller.

Shell globular, thin, transparent, very delicately obliquely striated, and thickly lined with very fine spiral striæ. Light yellow or reddish-brown, not very glossy, sometimes with a dark brown band on the periphery. Whorls five to six, suture deep. Spire somewhat raised, apex lighter than the rest of the shell. Aperture lunate, rather wide, somewhat reflected. Umbilicus wide and deep, exposing the internal convolutions. Diameter 14 to 18 mill., height 12 to 14 mill. It superficially resembles certain forms of H. cantiana, but the wide and deep umbilicus is very distinctive.

HABITAT. *Hedgerows in Germany, Austria, etc. Extinct in Britain, occurring only in Pleistocene Gravels. Mr. B. B. Woodward has recorded it from the River Drift at Ilford (see Proc. Geol. Assoc., vol. xi, no. 8, with figure). It was common in the Deposit at Barnwell, near Cambridge.*

HELICELLA VIRGATA Da Costa. 73

=HELIX VIRGATA, Da Costa.

Shell turbinate, strong, of very variable coloration; type white or cream-colour, with a single rich dark-brown band in the middle of the body whorl, and three or four narrow bands of the same colour below. Whorls six, body whorl very large, comprising more than one half of the shell. Spire somewhat raised, apex brown or horn-colour. Aperture rounded, ovate, with a dirty-red or purplish-brown internal rib. Umbilicus deep, but not large. Diameter 6·5 to 20 mill., height 6 to 12 mill. Animal yellowish-white, head and tentacles dark grey or purplish.

HABITAT. Downs and heaths, usually near the coast, but it occurs in many inland districts.

v. **depressa** Requien : Spire much depressed.

v. **subaperta** Jeffreys : Shell whitish, spire depressed, umbilicus wider.

v. **subglobosa** Jeffreys : Shell with a double band above the periphery, last whorl very large. Umbilicus very wide.

v. **carinata** Jeffreys: Shell yellowish-white, compressed above, periphery strongly carinated.

v. **lineata** Olivi: Shell slightly pyramidal, small, darker in colour (=v. submaritima Jeffreys).

v. **leucozona** Taylor: Shell purple-brown or reddish-brown, with a white peripheral zone, sometimes with a pale area around the umbilicus.

v. **rufulozona** Taylor: Shell yellowish or sand colour, with a single dark band at the periphery.

v. **maculata** Moquin-Tandon: Shell with bands, above and below, broken up into spots.

v. **radiata** Hidalgo: Shell with marking radiating from the apex, often appearing tesselated.

v. **nigrescens** Grateloup: Shell almost completely purple-brown, owing to the bands coalescing. More or less interrupted banding may appear, according to the degree of fusion.

v. **lutescens** Moquin-Tandon: Shell uniformly yellowish.

v. **hypozona** Moquin-Tandon: Shell entirely white above, with several bands below.

v. **epizona** L. E. Adams: Shell blotched with brown above the periphery, entirely white below.

v. **subalbida** Poiret: Shell white, with one continuous band above, uniformly white below.

v. **albicans** Grateloup: Shell entirely white with dark brown apex.

v. **alba** Taylor: Shell pure white.

v. **hyalozonata** Taylor: Shell white with translucent bands.
m. **sinistrorsum**: Shell sinistral.
m. **scalariforme**: Whorls partly disconnected.

HELICELLA ITALA Linné. 79

=Helix ericetorum Müller.

Shell depressed, circular, semi-transparent, indistinctly striated above, wrinkled below, whitish or pale horn colour, banded with chestnut-brown, apex brown. Whorls six, moderately convex. spire scarcely raised. Suture deepish. Periphery not keeled. Aperture almost circular. Umbilicus very large and deep, exposing three or four of the convolutions. Diameter 10 to 25 mill., height 6 to 8 mill. The finest examples occur on the sea coast. Animal reddish-brown, greenish, or greyish, head and tentacles darker.

Habitat. Dry heaths and downs on calcareous soils, especially near the sea.

v. **instabilis** Ziegler: Shell small, dark, sometimes streaked or spotted. Spire more produced, umbilicus narrower.
v. **leacozona** Moquin-Tandon: Shell reddish, with one white line on the outer whorl, frequently with many white and brown lines below.
v. **hyalozonata** Cockerell: White, with translucent bands. A very local form.
v. **alba** Charpentier: Shell pure white.
v. **lentiginosa** Moquin-Tandon: With markings which radiate from the centre.
m. **sinistrorsum**: Shell sinistral.

HELICELLA CAPERATA Montagu. 98

—HELIX INTERSECTA, Poiret.

Shell depressed, subconical, with numerous concentric rib-like striæ upon the whorls, white or cream-colour with narrow brown bands. Whorls six, not suddenly enlarging. Periphery bluntly keeled. Spire a little raised, with a blunt darkish apex. Suture rather deep. Aperture rounded, strongly ribbed internally with a white or flesh coloured rib. Umbilicus large and deep, but contracted by the penultimate whorl. Diameter 7 to 11 mill., height 6 to 8 mill. Animal ash colour, streaked or marbled with brown.

HABITAT. Under stones, and amongst vegetation in dry places.

v. **gigaxii** Charpentier. Shell small, much depressed, reddish, spotted above, with two bands below.

v. **subscalaris** Jeffreys: Shell conical, more convex.

v. **bizonalis** Moquin-Tandon: Shell white, with two continuous brown bands above, and several below. A rare form.

v. **ornata** Picard: Shell whitish, small, with one continuous brown band above, and two to six below.

v. **fulva** Moquin-Tandon: Shell dark brown or brownish, with transverse whitish lines. Usually occurs on limestone soils.

v. **lutescens** Pascal: Shell uniformly sand colour.

v. **obliterata** Picard: Shell white, with translucent banding or markings. A rare form.

v. **alba** Picard: Shell pure white.

m. **sinistrorsum** : Shell sinistral. (Rev. W. A. Shaw in J.C., April 1905.)

HELICELLA ELEGANS Gmelin.

=HELIX TERRESTRIS Pennant.

Shell pyramidal, livid white, with a broad brown band round each whorl, base flattened, the edge of each whorl very sharply carinated, the keel forming ridges round the shell. Closely and evenly striated in the line of growth in a radiating manner. Aperture much compressed, angulate. Diameter 9 mill., height 5·5 mill. Animal dark grey or ash-colour.

HABITAT. A chalky bank in a retired locality a few miles from Dover, in all probability intentionally introduced by a naturalist some years ago. It was a well established and thriving colony when discovered by Mrs. McDakin in 1890. Its continental home is the coasts of the Mediterranean.

v. **grisea** Moquin-Tandon : Shell bandless
v. **maculosa** Moquin-Tandon : Shell spotted.
v. **fulva** C. E. Wright : Shell uniformly dark brown.

HELICELLA BARBARA Linné. 44

=HELIX ACUTA Müller.
=BULIMUS ACUTUS Müller.

Shell cylindrical, irregularly striated, colour generally yellowish-white, streaked with pale brown, sometimes with a reddish-brown or black band below the periphery. Whorls eight or nine, rounded, gradually increasing in size, suture rather deep, spire tapering, apex blunt. Aperture oval. Umbilicus narrow, rather shallow. Diameter 5·5 mill., height 15 mill. Animal light yellowish-grey.

HABITAT. Calcareous downs, sandy pastures, and sandhills, on the south and west coasts of England, Abergele (N. Wales), Tenby (S. Wales), Cork and Portmarnock (Ireland). A Lusitanian species.

v. **inflata** Moquin-Tandon : Shell slightly ventricose.

v. **elongata** Cristofori & Jan.: Shell more slender. Diameter 5 mill., height 22 mill.
v. **bizona** Moquin-Tandon: Shell greyish-white, striæ absent, two dark bands on the body whorl.
v. **flammulata** Bourguignat: Shell greyish-white, striæ absent, marked with interrupted dark bands.
v. **strigata** Menke: Shell streaked with broad white ribs alternating with transverse semi-translucent brownish-grey streaks.
v. **articulata** Lamarck: Shell with transverse white ribs, alternating with broad violet-brown streaks.
v. **nigrescens** Taylor: Shell violet-brown with a few fine transverse white ribs, and a pale area bordering the umbilicus. (A form of v. articulata.)
v. **alba** Requien: Shell pure white.
m. **sinistrorsum**: Shell sinistral.

HELICELLA CANTIANA Montagu. 42

=HELIX CANTIANA Montagu.

Shell depressed, sub-globose, thin, glossy, semi-transparent, yellowish-white with a tinge of pale rose-colour towards the aperture. Whorls six to seven, convex, body-whorl occupying almost one half of the shell, generally with a faint white line near the periphery. Spire short and blunt, Suture rather deep. Aperture lunate, margin thin and slightly reflected, at a little distance from its edge is an internal thick white or rose-coloured rib. Umbilicus small, narrow, and deep. Diameter 16 to 21 mill., height 12 to 14 mill. Animal pale yellowish, with greyish tubercles. The shell in young specimens is hispid.

HABITAT. Among nettles and plants generally in marshy places in the southern counties of England. Distribution remarkably capricious, inhabiting restricted areas. Like H. pomatia it is not easily naturalised.

v. **pyramidata** Colbeau: Shell pyramidal, small, spire more raised.

v. **rubescens** Moquin-Tandon: Shell with last whorl reddish. Striæ fine and equal. Umbilicus narrow.

v. **galloprovincialis** Dupuy: Shell with the last whorl less depressed and lighter in colour. The striæ are finer and more equal, umbilicus narrower. Peristome red externally, white internally.

v. **albocincta** Cockerell: Shell with a white line along the periphery.

v. **albida** Taylor: Shell entirely opaque white.

m. **sinistrorsum**. Shell sinistral.

HELICELLA CARTUSIANA Müller. 6

=HELIX CARTUSIANA Müller.

Shell depressed, sub-globular, somewhat translucent, minutely striated. Whitish horn-colour, usually tinged with rufous near the aperture; immediately above the periphery it is obscurely marked with a milk-white spiral band. Whorls six to seven, body-whorl occupying nearly half the shell. Spire very little raised, often mammillary. Suture deepish. Aperture broadly lunate, with an internal whitish rib which is clearly discernible externally. Umbilicus very small. Diameter 10 to 14 mill., height 7·5 mill. Animal pale, closely tuberculated, mantle speckled with black and yellow. Closely related to H. cantiana, but differing in its smaller size, in being more solid and not so glossy, nearly opaque, and in the minute umbilicus.

HABITAT. A strictly south-eastern species, being confined to the chalk downs bordering the Kent and Sussex coasts.

v. **lactescens** Picard: Shell white (=albida Jenner).
v. **leucoloma** Stabile: Shell small with white peristome and rib.
v. **rufilabris** Jeffreys: Shell small with the inside rib of a reddish colour.

HYGROMIA FUSCA Montagu. 51

=HELIX FUSCA Montagu.

Shell sub-conical, depressed, extremely thin, almost membranaceous, glossy, fragile, marked with irregular transverse fold-like wrinkles. Colour that of transparent amber or horn-colour. Whorls five, convex, rapidly enlarging, body-whorl a little in excess of half the shell. Spire a little elevated, apex rather blunt. Suture shallow. Aperture rather large, lunate, reflected over the very shallow umbilicus. Diameter 7 to 9 mill., height 4 to 5 mill. Animal pale yellowish grey, tentacles bluish, surface of body granulated. Differs from H. sericea in its smaller size, greater fragility, the more depressed spire, and the proportionately larger body-whorl.

HABITAT. Under beeches, and among alder and sycamore leaves in woods.

v. **vitrea** Farrer: Shell pale glassy-green. Animal pure white excepting the tentacular retractors.

HYGROMIA GRANULATA Alder. 50

=HELIX SERICEA Jeffreys.

Shell sub-globose, conical, thin, pellucid, everywhere densely clothed with very delicate downlike hairs, which, when broken off, cause the surface to appear shagreened or granular, very faintly striated. Pale fulvous horn-colour, with faint indications of red-brown streaks. Whorls five or six, very convex, body-whorl rather less than one half of the shell. Spire elevated, apex rather blunt. Aperture crescent-shaped, broader than high, very slightly ribbed internally with white. Umbilicus very small and deep. Diameter 14·5 to 16 mill., height 8 to 9·5 mill. Animal yellowish-white, with greyish head and tentacles. The mantle is spotted with black, causing the shell to appear mottled.

HABITAT. Under stones in damp places in woods.

v. **carinata** Taylor: Shell strongly keeled at the periphery.

v. **cornea** Jeffreys: Shell very thin, semi-transparent, horn-colour. The labial rib may be seen from the outside.

v. **albida** Tye: Shell white.

HYGROMIA HISPIDA Linné. 118

Shell depressed, sub-globose, thin, semi-transparent, transversely striated, glabrous or with short deciduous hairs. Rufous horn-colour. Whorls five or six, moderately convex, body-whorl about one-third of the shell. Spire a little raised, apex more or less blunt. Aperture small, crescent-shaped, depressed, broader than high, with a white internal rib. Umbilicus moderately large. Diameter 9 to 10 mill., height 5 to 5·5 mill. Animal reddish-brown, minutely tuberculated, foot narrow.

HABITAT. Under stones by roadsides, and amongst grass, moss, and nettles.

v. **subglobosa** Jeffreys: Shell very thin, more globular, horn-colour or white, with a very small umbilicus.

v. **conica** Jeffreys: Shell smaller with a more elevated spire.

v. **hispidosa** Mousson: Shell sub-orbiculate, smaller, yellowish-brown, periostracum covered with fine white hairs which are less deciduous than those of the type. Diameter 7·6 mill., height 4·7 mill. Animal greyish-brown, mottled black and white, foot thick, broad, yellowish-white. The Helix hispida Jeffreys of old authors.

v. **depilata** Alder: Shell glabrous, usually more depressed. whorls more rounded.

v. **nana** Jeffreys: Shell much smaller, spire depressed, labial rib very pronounced.

v. **subrufa** Moquin-Tandon: Shell thicker, reddish, glabrous.

v. **albocincta** Taylor: Shell red-brown, with a whitish peripheral band.

v. **albida** Jeffreys: Shell thinner, white.

HYGROMIA REVELATA Férussac. 3

Shell depressed, sub-globose, thin, diaphanous, indistinctly striated, the striæ in part concealed by short and scattered hairs. Colour greenish-olive. Whorls four to five-and-a-half, convex, ventricose, rapidly enlarging, two-thirds of the shell comprising the body-whorl. Spire short, apex obtuse, suture, very deep. Aperture nearly circular, without an internal rib. Umbilicus small, moderately deep. Diameter 6 to 7 mill., height 4·5 to 6 mill. Animal greyish with yellowish sides and foot. Head and tentacles brownish.

HABITAT. Under stones on open downs in Devon, Cornwall, and the Channel Islands. A Lusitanian species.

HYGROMIA MONTIVAGA Westerlund.

Shell almost spherical, depressed, very crustaceous, transparent, coarsely striated, peristome with scattered white hairs. Greenish-yellow, with a definite red-brown band on each side of a white peripheral band. Whorls five, regularly increasing, somewhat angular, a little arched below, deflected near the mouth. Spire but slightly raised, apex blunt. Aperture rounded, forming three-fourths of a circle, provided with a strong white internal rib, which may be plainly seen from the outside. Diameter 5 to 6 mill., height 3·5 to 4·5 mill. At first sight not unlike certain immature forms of H. virgata, but the strong white rib is very distinctive.

HABITAT. *A Lusitanian species no longer living in Britain, but which occurs in Pleistocene deposit at Harlyn Bay, about two-and-a-half miles west of Padstow on the north coast of Cornwall, from which locality it was first recorded for this country by the Rev. R. Ashington Bullen, B.A., F.L.S., F.G.S., about four years ago (Notes on Holocene Mollusca from North Cornwall, Proc. Malac. Soc. vol. V, 1902)*

HYGROMIA RUFESCENS Pennant. 91

HELIX RUFESCENS, Pennant.

Shell depressed, sub-globose, sub-carinated, slightly translucent, coarsely striated transversely. Usually reddish-horn colour (but the colour varies from white to reddish-brown), with a whitish-band at the angulation. Whorls six, moderately convex, not abruptly enlarging, body-whorl occupying about half of the shell. Spire but little raised, apex blunt. Aperture semi-elliptical obtuse, with a remote white rib. Umbilicus large.

Diameter 12 to 14 mill., height 6 to 7·5 mill. Animal darkish-grey, tuberculated, foot narrow, pale yellow. Very young specimens are sometimes hispid, in which state they might be mistaken for H. hispida if the keel on the margin of the last whorl is not carefully observed. In the adult state it is a larger, less rounded and compact shell than H. hispida.

HABITAT. Under sticks and stones and among nettles in hedgerows and gardens, also woods. It is a well-known pest in gardens on calcareous soils.

v. **albolabiata** Von Martens: Mouth and lip white.

v. **rubens** Moquin-Tandon: Shell more or less reddish.

v. **albocincta** Cockerell: Shell with a prominent white band around the periphery.

v. **alba** Moquin-Tandon: Shell pure white.

m. **scalariforme**: Whorls partially disjointed. (E. W. Swanton, in J.C. April 1905.)

HYGROMIA UMBROSA Partsch.

Testa late umbilicate, suborbiculato-depressa, obtuse carinata, tenuis, pellucida, opaca, cornea vel albido-lutescens, subtilissime granulata, apertura transverse ovata, peristomate simplici, reflexo, marginibus approximatis. R. a. 2·5-4'''; l. 5-7'''; anfr. 5. (Rossmässler's Iconographica, i, 64.) Animal yellowish-grey, head and back somewhat darker. Mantle spotted with black. Very near to H. rufescens, of which species it may possibly be only an extremely small form.

HABITAT. *A continental species, now extinct in Great Britain. It has been recorded from the Pleistocene deposits of Ightham, Kent.*

ACANTHINULA ACULEATA Müller.

=HELIX ACULEATA Müller.

Shell minute, conical, globose, with its periostracum raised into rib-like laminæ, which, in the middle of each whorl, are produced into lanceolate points, causing the shell to appear armed with sharp spines. Uniformly brownish-horn-colour. Whorls, four, ventricose, deeply separated. Spire elevated. Aperture almost semi-circular. Umbilicus moderately large and deep. Diameter 2·5 mill., height 2·75 mill. Animal bluish-grey, head and mantle pale brown.

HABITAT. Woods, hedges, and old walls, also amongst dead leaves, which it so closely resembles in colour as to be detected with difficulty. It often resembles a bit of dirt, owing to the accumulation of dirt between the spines.

v. **albida** Jeffreys: Shell whitish or cream colour.

ACANTHINULA LAMELLATA Jeffreys. 23

=HELIX LAMELLATA Jeffreys.

Shell minute, conoid-globose, nearly as high as broad, thin, slightly transparent, usually with a satin-like gloss, periostracum with rather close-set longitudinal plaits, which are never elongated into spinous processes. Uniformly pale yellowish horn-colour. Whorls five to six, convex, suture deep. Spire raised, apex rather blunt. Aperture narrow, crescent-shaped, depressed. Umbilicus small, deep. Diameter 2 to 2·3 mill., height 2 mill. Animal creamy-white, slatey-grey above with a yellowish-white line in the mid-dorsal region.

HABITAT. Decaying leaves, fern fronds, and moss on rocks in the neighbourhood of running water in woods in the north of England, (also Staffordshire), the north and west of Scotland, and the north of Ireland. A characteristic northern species, but in Pleistocene times it spread down to the Thames valley, for it occurs in the gravels at Copford and at Barnwell.

VALLONIA PULCHELLA Müller. 83

=HELIX PULCHELLA Müller.

Shell minute, sub-orbicular, rather depressed, semi-transparent, equally convex above and below, smooth and glossy. Milk-white, without banding or variegation of any kind. Whorls three-and-a-half, body-whorl larger than the rest of the shell, suture rather deep. Spire but slightly produced, apex blunt and smooth. Aperture circular, with a very thick opaque white peristome expanded above and reflected below. Umbilicus large and deep. Diameter 2·5 to 3 mill., height 1·5 mill. Animal usually described as milk-white with black eyes, but we have not infrequently seen specimens with very dark or quite black bodies, others slate-colour. Indeed we cannot recollect ever having seen a specimen with a milk-white body.

HABITAT. Walls, under stones, and amongst grass and moss.

VALLONIA COSTATA Müller.

Shell minute, sub-orbicular, semi-transparent, equally convex above and below, not very glossy, with numerous transverse elevated and curved membraneous ribs, as well as intermediate striæ. Milk-white, sometimes slightly pinkish. Whorls three-and-a-half, body-whorl larger than the rest of the shell, suture deep. Spire slightly produced, apex with very minutely raised revolving lines, which may be easily seen under a two-inch objective. Aperture circular, margin very thick and strongly reflected, forming a double peristome. Diameter 2·5 to 3 mill., height 1·5 mill. Animal bluish-grey. This is Helix pulchella variety costata of the old lists. According to Dr. Sterki "the presence of very fine raised revolving lines on the nucleus or the $1\frac{1}{2}$ embryonal whorls" distinguishes this species from Vallonia pulchella which has a smooth nucleus. It is quite distinct from V. pulchella, though worn examples may lead to the erroneous conclusion that there are transition forms.

HABITAT. On old walls and under stones amongst grass and moss. Distribution probably the same as that of the preceding species.

VALLONIA EXCENTRICA Sterki.

"Shell of medium size, with major diameter marked by longer, and with irregular, somewhat elongated umbilicus, at first rather narrow, then for the last one-third whorl rapidly widening, slightly rounded convex above, smooth or very finely irregularly striate, strongly and regularly at the umbilicus; nucleus smooth; pale horn-coloured, transparent or slightly opaque, with a somewhat faulty gloss; whorls $3\text{-}3\frac{1}{2}$, rather rapidly increasing with a moderately deep suture, the last comparatively large, well rounded, expanding near the aperture, not descending, or very little at the suture, aperture moderately oblique and inclined, $\frac{5}{6}$ circular, sub-angular at the base; the umbilical margin somewhat protracted; peristome not warted above, very little at the periphery, and moderately below, with a rather strong white lip, thinner at the ends, visible through the shell. Diam.: maj. 2·3, min. 1·8, alt. 1·1 mm."* Mr. B. B. Woodward in a communication to the Journal of Conchology July 1904 (p. 82) remarks: "The umbilicus in V. excentrica is not only excentric as contrasted with that of V. pulchella but is less open, and the sutures of the whorls within are more impressed. There are therefore three species of Vallonia in the British Islands that have hitherto all passed under the name of V. pulchella (Müll.). From a preliminary inspection of the material in my collection, it is apparent that all three also occur in a fossil state."

HABITAT. Similar situations to V. pulchella, and in all probability it is equally widely distributed. It has been quite recently recorded from Ireland (J.C. April 1905).

HELICODONTA OBVOLUTA Müller. 6

=HELIX OBVOLUTA Müller.

Shell orbicular, depressed on both sides, a little opaque, obscurely hispid and somewhat wrinkled above. Dull umber-brown colour, not variegated. Whorls six, narrow, rounded, gradually increasing, suture rather deep. Spire depressed, sunk below the upper level of the body-whorl. Aperture somewhat triangular, with a thick and much reflected peristome (lacking in young specimens), often of a pinkish hue within. Umbilicus large, deep. Diameter 12 to 13 mill., height 5.5 to 6 mill. Animal light reddish-brown above, paler below.

HABITAT. Moss at the base of hazel bushes in woods on the northern escarpments of the Downs of Hants, Sussex, Kent, and Surrey; Ditcham Wood and Up Park are well known localities. It does not occur in Scotland and Ireland. It is interesting to note that at one time it must have had a much wider range northwards, for it has been found in the gravels of the Cam at Granchester.

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* From the original description by Dr. V. Sterki in Proc. Acad. Nat. Sci., Philadelphia 1893, p. 252.

m. **sinistrorsum**: Shell sinistral.

HELICIGONA LAPICIDA Linne. 42

=HELIX LAPICIDA Linné.

Shell depressed, lenticular, very sharply keeled upon the middle of the body-whorl, thin, slightly transparent, not polished. Yellowish, horn-colour, or pale rufous, streaked irregularly with rufous-brown. Whorls five, slightly convex, the last suddenly deflected near the aperture, suture shallow. Spire slightly produced, apex smooth and blunt. Aperture oval, somewhat angulated, with a whitish reflected outer lip. Umbilicus large, deep. Diameter 15 to 16·5 mill., height 6·5 to 7 mill. Animal yellowish-brown with dark brown stripes, foot-fringe pale brown or greenish.

HABITAT. Walls, hedgerows, and woods on calcareous soils, chiefly in the central and southern counties of England.

v. **subangulata** Pascal: Body-whorl rounded, not carinated at the periphery.

v. **nigrescens** Taylor: Shell uniformly very dark, almost black, except the apex which is paler. Peristome white.

v. **albina** Menke: Shell uniformly white or whitish.

m. **scalariforme** : Whorls disjointed.

HELICIGONA ARBUSTORUM Linné. 89

=HELIX ARBUSTORUM Linné.

Shell globose, sub-opaque, glossy, with delicate transverse striæ. Colour very variable, typically a rich brown, marbled and mottled with yellowish spots with a single darker brown band just above the middle of each whorl. Whorls six, convex, and well defined, body-whorl about two-thirds of the shell. Spire conoid, obtuse. Aperture rounded, lunate, broader than high, with a white reflected peristome. Diameter 19 to 24 mill., height 16 to 20 mill. Animal dusky olive-green, or bluish-black, roughly granulated.

HABITAT. Woods, hedgerows, osier beds, and vegetation on the banks of rivers.

v. **alpestris** Ziegler : Shell about half the normal size, spire more raised.

v. **conoidea** Westerlund : Shell large, conical, irregularly striated, with transversely confluent pale yellow markings : sub-perforate.

*v. **fusca** Férussac : Shell depressed, very thin, semi-transparent, almost uniformly brown.

v. **canigonensis** Boubec : Shell of a uniform brown colour with a dark band (=v. repellini Taylor).

v. **fuscescens** Duchassing : Shell as in type but without bands (=v. marmorata Taylor).

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*v. **picea** Ziegler : Shell completely covered with a pitch black periostracum ; neither depressed nor semi-transparent. A melanistic form not recorded in the Society's List, but specimens have been taken near Manhull in Dorset. It is near to the var. æthiops Bielz., which occurs at an altitude of 6,500 feet on the mountains of Transylvania, but the latter is narrowly umbilicated.

- v. **cincta** Taylor: Shell yellowish or creamy-white with bands (= v. pallida Taylor).
- v. **luteofasciata** Duchassing and Michelotti: Shell with translucent bands.
- v. **flavescens** Moquin-Tandon: Shell almost uniformly yellow or yellowish.
- v. **albina** Moquin-Tandon: Shell white, unicolor.
- m. **sinistrorsum**: Shell sinistral.

HELIX ASPERSA Muller. 116

Shell obliquely conoid-globose, thin, sub-opaque, wrinkled, periostracum yellowish-olive. Colour whitish or pale fawn with chocolate-brown bands often confluent, sometimes obsolete. Whorls four to four-and-a-half, moderately convex, rapidly enlarging, the body-whorl being very large and abruptly deflected, suture oblique. Spire short, conoid, apex blunt. Aperture nearly oval, slightly lunate. Umbilicus indistinct. Diameter 30 to 48 mill, height 32 to 38 mill. Animal brownish-grey, spotted with white and brown.

HABITAT. Woods, gardens, and fields, always more abundantly in the vicinity of human dwellings, especially on calcareous soils.

- v. **conoidea** Picard: Shell conical, elongated, thin and fragile, aperture small.
- v. **globosa** Moquin-Tandon: Shell nearly globular, very large.
- v. **tenuior** Shuttleworth: Shell small, uniformly reddish, very thin and transparent.
- v. **nigrescens** Moquin-Tandon: Shell almost uniformly smoky brownish-black.
- v. **undulata** Moquin-Tandon: Shell small,

reddish, thin and transparent, with brown and whitish longitudinal wavy wrinkles.

v. **flammea** Picard: Shell reddish with longitudinal flame-shaped more or less interrupted markings, bands very indistinct.

v. **albofasciata** Jeffreys: Shell reddish-brown with a single white band.

v. **zonata** Moquin-Tandon: Shell yellowish or reddish, with five narrow bands, the three upper ones continuous.

v. **unicolor** Moquin-Tandon: Shell uniformly rendish-brown.

v. **exalbida** Menke: Shell yellowish-white or greenish-white, unicolor.

m. **sinistrorsum**: Shell sinistral.

m. **scalariforme**: Whorls more or less united. Shell sometimes resembles a ram's horn.

HELIX POMATIA Linné. 11

Shell large, globose, solid, with coarse oblique striæ. Whitish or pale tawny, with rufous spiral bands. Whorls five, body-whorl more than two-thirds of the shell, suture distinct. Spire short, with blunt apex. Aperture lunate-oval, white except at the margin, which is brownish; inner lip dilated and reflected. Umbilicus very narrow. Diameter 38 to 48 mill., height 39 mill. Animal brownish-grey, speckled or mottled with white and brown. The largest of our native Helices. At one time thought to have been introduced by the Romans, a supposition negatived by its discovery in pre-Roman interments.

HABITAT. Woods and hedgerows. Confined to calcareous soils in the southern counties of England.

v. **albida** Moquin-Tandon: Shell uniformly white or cream-colour. Periostracum present.

m. **sinistrorum**: Shell sinistral (J.C. July, 1904, p. 96).

HELIX NEMORALIS Linne. 125

Shell moderately large, sub-globose, sub-opaque, rather glossy, wrinkled more or less by the lines of growth. Colour extremely variable, sometimes unicolour, sometimes banded, never mottled nor marbled as in H. arbustorum. Whorls five, convex, body-whorl deflected near the mouth. Spire short, apex blunt. Aperture semi-lunar, broader than high. Outer lip reddish-brown, thick, inner lip thin, dark chocolate-brown. Umbilicus indistinct. Diameter 16 to 25 mill., height 15 to 16·75 mill. Animal dark brown, mantle pale yellow; tuberculated. Often found in company with H. hortensis; the latter differs in being smaller, thinner, and in having a white or rose-coloured peristome.

HABITAT. Woods, hedges, and gardens, very frequent on sand dunes by the sea, and amongst gorse bushes on hillsides.

v. **conica** Pascal: Shell with an elevated cone-like spire.

v. **compressa** Terver: Spire much depressed.

v. **ponderosa** Malm.: Sheil very large, thick, and heavy, with large umbiticus.

v. **roseolabiata** Taylor: Peristome and rib pink or very pale brown.

v. **albolabiata** Von Martens: Shell with white mouth and rib. Must be carefully distinguished from weather-worn shells.

v. **bimarginata** Moquin-Tandon: Peristome brown outside, and white internally.
v. **rubella** Moquin-Tandon: Shell pink, bands reddish, usually bordered with white.
v. **libellula** Risso: Shell yellow, bands dark, sometimes bordered with white.
v. **albina** Moquin-Tandon: Shell white or cream colour.
v. **castanea** Moquin-Tandon: Shell brown.
v. **olivacea** Risso: Shell olive-brown.
v. **roseozonata** Cockerell: A rare form with pink bands.
v. **hyalozonata** Taylor: Shell with translucent banding.
v. **citrinozonata** Cockerell: Shell with dark green bands.
v. **undulata** Gentiluomo: Shell with bands fading and deepening.
m. **sinistrorsum**: Shell sinistral.
m. **scalariforme**: Whorls more or less separated.

HELIX HORTENSIS Müller. 104

Shell subglobose, semi-transparent, thin, very glossy, wrinkled by the lines of growth. Colour very variable, unicolorous or banded. Whorls five, convex. Spire short, apex blunt. Aperture semi-lunar. Outer lip thick, white or rose-coloured, rarely dark. Diameter 15 to 20 mill., height 14 to 16 mill. Animal reddish, yellowish, or pale grey. Superficially resembles small forms of the preceding species, but is usually thinner, lighter in colour, and quite distinctive in the white or rose-coloured peristome.

HABITAT. Hedgerows, gardens, and woods. H.

nemoralis and H. hortensis often occur together, but the latter is usually more abundant in the vicinity of human habitations.

v. **roseolabiata** Taylor: Shell with pink or rose-coloured rib.
v. **fuscolabiata** Von Martens: Shell with dark peristome and rib.
v. **luteolabiata** L. E. Adams: Shell with yellow peristome and rib.
v. **tenuis** Baudon: Shell very thin and translucent.
v. **albina** Moquin-Tandon: Shell uniformly white or whitish.
v. **lutea** Moquin-Tandon: Shell yellow, with or without bands.
v. **incarnata** Moquin-Tandon: Shell bright rose-colour, with or without bands.
v. **olivacea** Taylor: Shell deep olive-brown.
v. **lilacina** Taylor: Shell uniformly bluish-violet.
v. **roseozonata** Cockerell: Shell straw-colour, with reddish bands.
v. **arenicola** Macgillivray: Shell with non-pigmented, translucent bands.
m. **sinistrorum**: Shell sinistral.

HELIX PISANA Müller. 6

Shell sub-globose, somewhat depressed, sub-opaque, glossy. Creamy-white with very narrow spiral chestnut-brown bands mottled or streaked with white spots. Whorls five to five-and-a-half, convex, the last a little flattened above, and occupying about two-thirds of the shell. Spire moderately raised, with dark brown and blunt apex. Aperture broadly lunate, dilated, with rose-coloured and reflected peristome. Umbilicus narrow, oblique. Diameter 17 to 20 mill., height 13 to 15 mill. Animal yellowish-grey, upper tentacles purplish.

HABITAT. Sandhills near the coast in Cornwall, South Wales. and the south-east of Ireland. A Lusitanian species.

v. **tenuis** Taylor: Shell horn-colour, translucent.
v. **lineolata** Moquin-Tandon: Shell whitish, with many very narrow brown or reddish lines, above and below.
v. **albida** Moquin-Tandon: Shell uniformly white or cream-colour.
v. **alba** Shuttleworth: Shell white or pale yellow with translucent bands.
m. **scalariforme**: Whorls disunited.
m. **sinistrorsum**: Shell sinistral.

HELIX LIMBATA Draparnaud.

The following note which appeared in the 'Irish Naturalist,' 1898, vol. vii, p. 150, is given here as it is possible that Helix limbata may be entitled eventually to rank as a well-established alien. It does not, however, find a place at present in the Conchological Society's List:

"Helix limbata, Drap., a Pyreneen shell introduced at Belfast, discovered last summer feeding on a roadside at Belmont, Co. Down, close to Dickson's nursery. Mr. Dickson imports many plants from the South of France, and as many of these have large balls of earth round the roots it would be easy for shells to come with them. The shell is translucent, white, with one opaque white band. When full grown it would be about half an inch broad. H. limbata does not range further north than the Loire, inhabiting the country north and south of the Pyrenees."

ENA MONTANA Draparnaud. 7

=Bulimus montanus Draparnaud.

Shell oblong, conical, gradually tapering to a blunt apex, thinnish, rather glossy, with minute close-set spiral striæ. Uniformly deep brown or chocolate-colour. Whorls seven to seven-and-a-half, body-whorl a little less than half the shell. Suture oblique, shallow. Aperture simple, sub-oval, livid or reddish-brown, with a thick peristome which is reflected over the narrow and somewhat deep umbilicus. Diameter 6 mill., height 15 mill. Animal greyish-brown, mottled with nearly black irregular spots.

Habitat. Amongst fallen beech leaves in woods, and the dead fronds of Scolopendrium vulgare in hedgerows. Entirely confined to the southern counties of England.

v. **albina** Moquin-Tandon: Shell uniformly whitish or cream-colour.

ENA OBSCURA Müller. 71

=Bulimus obscurus Müller.

Shell oblong, oval, thin, glossy, and semi-transtransparent. More cylindrical than E. montana, the penultimate whorl almost equalling the body-whorl in size. Colour yellowish-brown. Whorls six, rounded, with a well-pronounced suture. Spire elongated, apex blunt. Aperture oval, with a much reflected white peristome. Umbilicus narrow and shallow. Diameter 3·5 to 4·5 mill., height 9 to 10 mill. Animal rugose, dark grey or brownish, mottled with darker spots. Foot-sole pale grey. The smaller size and the white reflected margin of the aperture readily distinguish this species from E. montana.

HABITAT. Under stones and on trees in woods (especially beech), and old moss-clad walls and ruins. Sometimes coated with dirt, when it is difficult to detect.

v. **albina** Moquin-Tandon: Shell uniformly white or cream-colour.

OPEAS GOODALLI Miller.
=BULIMUS GOODALLI Miller.

Shell turreted, elongated, thin, minutely and regularly striated in the line of growth. Pellucid horn-colour. Whorls five to six, rarely eight, somewhat convex, body-whorl conspicuously inflated, occupying about one-third of the whole shell. Suture very broad. Spire elongated, apex obtuse. Aperture ovate, oblong, with a simple acute peristome. Umbilicus absent. Diameter 1·5 to 1·75 mill., height 5 to 6 mill.

HABITAT. Nurseries and hothouses only, in many parts of England. A native of the West Indies, said to have been introduced into this country with pine plants. It was first seen in Miller and Sweet's Nursery, near Bristol, about 1816.

OPEAS CLAVULUS Férussac.

Apparently an error has been made in including O. clavulus as distinct from the preceding species. Mr. Edgar A. Smith writes "Cochlicella clavulus Férussac was never described by that author, but merely appears in his tableau systematique p. 56, with the following information with regard to its locality: "Isle de France ??" "Hab.? La Guadeloupe." It is regarded as synonymous with Opeas Goodalli Müller." Mr. S. Kennard says, however, that it was found in a hothouse at Nottingham, and differs slightly from O. Goodalli

OPEAS URICHI Smith.

"Testa elongata, turrita, augusta, rimata, pallida, pellucida, nitida, striis incrementi tenuibus obliquis arcuatis sculpta; anfractus 8 mediocriter convexi, ad suturam crenulati; spire producta, ad apice sub-obtusa; apertura parva, inverse-auriformis, longit, totius ¼ fere adæquans; labrum tenuissimum, oblique-arcuatum; columella rectiuscula, superne anguste reflexa, infra medium sub-truncata vel plicata. Longit 10½ millim.; diam. 3, apertura fere 3 longa." (The original description by Edgar A. Smith, in J.C. vol. viii, p. 235).

HABITAT. Hothouses in a few localities. A native of the West Indies, first discovered at Oropouche, Trinidad, by Mr. Urich.

SUBULINA OCTONA Chemnitz.
STENOGYRA OCTONA Guppy.

Shell fusiform, turreted, thin, transparent, glossy, minutely striated. Yellowish horn-colour. Whorls eight, somewhat convex, body-whorl about three-sevenths of the total length. Suture deepish. Spire elongated, apex obtuse. Aperture small, rounded, pyriform, acute above, simple. Diameter 3 to 4 mill., height 14 to 16 mill.

HABITAT. The West Indies, northern parts of South America, near Lake Tanganyika, and Madagascar. In this country it occurs as an introduction in greenhouses. It is recorded from near Manchester (by Mr. J. R. Hardy) and other localities.

COCHLICOPA LUBRICA Müller. 128

ZUA LUBRICA Müller.

Shell elongated oblong, rather thin, glossy, highly polished, transparent. Wholly of a brownish-umber or smoky horn-colour. Whorls five to six, regularly convex, body-whorl comprising about one half the shell. Suture deep, wrinkled. Spire tapering, with a blunt apex. Aperture small, oval, elliptical, simple. with a thick outer lip, thickened within by a narrow reddish rib. Umbilicus absent. Diameter 2·3 to 2·5 mill., height 5·4 to 8 mill. Animal slaty-grey, head and tentacles darker, mantle brownish-grey with white dots.

HABITAT. Under stones, sticks, moss, and decaying vegetation, in both moist and dry situations.

v. **lubricoides** Férussac: Shell small and slender.

v. **ovata** Jeffreys: Shell oval, small, spire short.

v. **morseana** Doherty: Shell very large, slender, whorls somewhat flattened.

v. **exigua** Menke: Shell very small and thin.

v. **fusca** Moquin-Tandon: Shell darker, more or less deep brown colour.

v. **hyalina** Jeffreys: Shell greenish-white. A common form.

AZECA TRIDENS Pulteney. 34

=COCHLICOPA TRIDENS Pulteney.

Shell fusiform, sub-cylindrical in the middle, tapering at the extremities, glossy, semi-transparent, transversely striated. Pale yellowish-brown. Whorls seven, periphery rounded in adult specimens but simply keeled in young ones. Suture shallow, fringed with a moniliform band. Spire produced, apex blunt. Aperture very small, pyriform, oblique, armed internally with three (or more) denticles—one on the columella, one in the middle of the base of the penultimate whorl, and the third on the inside edge of the outer lip. No umbilicus. Diameter 3 mill., height 7 mill. Animal slaty-grey, with black spots, or nearly black above.

HABITAT. Amongst moss and decaying leaves in woods. Apparently rare in the south-west of England.

v. **nouletiana** Dupuy: Shell large, thinner, and with a single denticle only on the outer lip.
v. **alzenensis** St. Simon: Outer lip with two denticles in addition to those in the type.
v. **crystallina** Dupuy: Shell transparent greenish-white.
v. **elongata** Taylor: Spire greatly elongated.
m. **sinistrorsum** Taylor: Shell sinistral.

CÆCILIOIDES ACICULA Müller. 32

=ACHATINA ACICULA Müller.

Shell fusiform, slender, cylindrical, very fragile, glossy, obscurely striated. Uniformly white. Whorls six, the penultimate one abruptly elongated, body-whorl occupying one-half of the shell. Suture deep, oblique. Aperture lanceolate, simple, acutely angulated above, deeply notched at the base. Umbilicus absent. Diameter 1·25 mill., length 4·4 to 5 mill. Animal white, tentacles said to be eyeless.

HABITAT. Gravel pits, and at the roots of grasses, chiefly on calcareous soils. Often found in abundance in rejectamenta after floods. Very rare in Scotland and Ireland.

JAMINIA SECALE Draparnaud.

=PUPA SECALE Draparnaud.

Shell sub-cylindrical, conical, glossy, with fine oblique striæ in the line of growth. Dull brown or reddish horn-colour. Whorls seven to nine, regularly but very gradually enlarging. Spire elongated, apex not very obtuse. Aperture semi-oblong, with seven or eight denticles, three on the outer lip, usually with a smaller one above them, two on the columella, and two on the columellar lip (sometimes an additional denticle is present here). Peristome white, not much reflected. Umbilicus small. Diameter 3 mill., height 6·1 to 8 mill. Animal blackish-brown above, paler below, mantle spotted with black.

HABITAT. Upon stones on hillsides and amongst herbage on oolitic limestone, hence more abundant in the West of England.

v. **alba** Jeffreys: Shell white.

v. **edentula** Taylor: Shell small, thinner, and more glossy, peristome without denticles.

v. **boileausiana** Charpentier: Shell small, peristome with the larger denticle entirely double, and with an additional denticle at the angle of the columellar border.

JAMINIA QUINQUEDENTATA Born.

=PUPA CINEREA Draparnaud.

Shell sub-cylindrical, nearly smooth, finely striated longitudinally. Greyish-white or brownish, with small patches of white. Whorls nine or ten. Suture very distinct. Aperture ovate, armed with five denticles, three above and two below. Lip broadly reflected, thin, white. Umbilicus an elongated shallow chink. Diameter 3·5 to 4 mill., height 14 mill. Animal greyish-black, lighter below.

HABITAT. Old walls and amongst moss in woods in France, Italy, &c. Introduced among the roots of plants into a few hot-houses and nurseries in this country.

JAMINIA ANGLICA Férussac. 35

=PUPA RINGENS Jeffreys.

Shell conical, sub-cylindrical, obscurely striated, glossy, globose. Uniformly horn-colour or chocolate-brown. Whorls six to seven, regularly enlarging, body-whorl occupying about one-third of the shell. Suture definite, shallow. Aperture sub-semicircular, armed with five denticles or plaits; one on the inner edge of the outer lip, which, together with a conspicuously curved parietal one, somewhat isolates a small part of the mouth. A smaller parietal plait, a strong columellar and an inferior palatal one, and a basal denticle, complete the armature. Peristome reddish-brown. Umbilicus narrow, distinct. Diameter 1·75 to 2 mill., height 3.75 to 4 mill. Animal lead-colour above, whitish below.

HABITAT. Under stones and among moss and dead leaves in damp woods in the North of England, West of Scotland, Ireland, Anglesea, and Channel Islands. A Lusitanian species.

v. **pallida** Jeffreys: Shell lighter or whitish.
v. **alba** Collier: Shell pure white.

JAMINIA CYLINDRACEA Da Costa. 120

= PUPA UMBILICATA Draparnaud.

Shell oblong, cylindrical, thin, somewhat pellucid, shining. Pale olivaceous-brown, or dark horn-colour. Whorls six to seven, rounded, distinctly but gradually enlarging. Suture shallow, oblique. Spire short, apex blunt. Aperture obliquely semi-oval, with a single denticle closely adjacent to the angle formed by the junction of the outer lip. Peristome broad, much reflected, white externally, reddish-brown internally. Umbilicus small, narrow. Diameter 2 to 2·5 mill., height 3·75 to 4·75 mill. Animal dark grey, head and tentacles spotted with black, foot-fringe and sole almost white.

HABITAT. On walls, and under stones and moss in hedges and woods, sometimes in very numerous, colonies. The commonest of our native Vertigines.

- v. **edentula** Moquin-Tandon: Aperture without denticle.
- v. **gracilis** Issel: Shell much elongated, slender.
- v. **curta** Westerlund: Shell short, ovoidal, tumid.
- v. **sempronii** Charpentier: Shell small, aperture without denticle, peristome dark brown externally.
- v. **albina** Moquin-Tandon: Shell completely white.

JAMINIA MUSCORUM Linné. 68

=PUPA MARGINATA Draparnaud.

Shell ovate, cylindrical, glabrous, not shining, minutely striated. Yellowish-brown or chestnut colour. Whorls six or seven, a little rounded, body-whorl about one-third of the entire length. Suture deepish. Spire short, apex blunt. Aperture semi-circular, generally with a small tubercular denticle deeply seated in the middle of the base of the last whorl, always with a strong white rounded external rib behind the outer lip. Umbilicus narrow. Diameter 1·75 to 2 mill., height 3 to 4 mill. Animal bluish-black above, paler below and spotted with black, the lower tentacles very short. The dull striated surface and the thick white external rib at once distinguish this species from J. cylindracea.

HABITAT. On rocks and walls, under stones and moss, and at the roots of seaside plants. Especially prolific on limestone soils.

v. **bigranata** Rossmässler: Aperture with two denticles.
v. **edentula** Clessin: Aperture without denticle.
v. **elongata** Clessin: Shell long, slender.
v. **brevis** Baudon: Shell very short, stout, denticle thick, peristome white.
v. **albina** Menke: Shell uniformly whitish.
m. **sinistrorsum**: Shell sinistral.

VERTIGO MINUTISSIMA Hartmann. *7*

Shell minute, thin, cylindrical, semi-transparent, regularly and strongly striated obliquely, slightly lustrous. Uniformly pale yellowish-umber colour. Whorls five-and-a-half, short, much rounded, deeply divided by a simple suture. Spire produced, apex very obtuse. Aperture without denticles, roundish-oval, curved inwards towards the centre of the lower lip. Umbilicus oblique, narrow. Diameter ·65 mill., height 2 mill. Animal dark grey, streaked with black on the head and tentacles, mantle greyish-brown, foot-fringe and sole whitish.

HABITAT. Under stones on hillsides in a few localities in England and Scotland. Possibly often overlooked through its minute size. It is widely diffused on the Continent.

VERTIGO ANTIVERTIGO Draparnaud. *37*

Shell minute, ovate-oblong, slightly polished. Dark chestnut-brown or tawny-chestnut colour.

Whorls four to five, body-whorl conprising about one half of the shell. Suture deepish. Spire short, with a blunt apex. Aperture oblique, sub-cordate, usually with seven deeply-seated distinct denticles. Peristome slightly reflected, whitish, with a broad but rather obscure rib behind it. Umbilicus distinct, narrow. Diameter 1 to 1·5 mill., height 2·3 to 2·5 mill. Animal blackish-grey, lower tentacles much reduced.

HABITAT. Under stones and about the roots of plants in marshy places, also under logs and stones on the banks of streams and lakes. Does not occur north of the Moray Firth.

v. **octodentata** Hartmann: Aperture with eight denticles.

v. **sexdentata** Montagu: Aperture with six denticles.

VERTIGO SUBSTRIATA Jeffreys. 26

Shell minute, shortly ovate, or somewhat fusiform, strongly and regularly striated, sub-opaque. Tawny or light yellowish horn-colour, rarely of an olivaceous tint. Whorls four-and-a-half, well rounded, very ventricose, the penultimate bulging a little beyond the others. Suture deep. Spire obtuse, apex blunt. Aperture obliquely sub-pyriform, armed with six deeply-seated and mostly pliciform denticles — two columellar, two parietal, and two palatal. There are sometimes three in the last position, and only one on the columella. Umbilicus small. Diameter 4 to 4·3 mill., height 2 mill. Animal dark grey above, paler below. The ovate form and the strong transverse striæ are characteristics which easily distinguish this species from its allies.

HABITAT. Under stones and at the roots of vegetation on the borders of lakes, and amongst decaying leaves in damp glens. It occurs chiefly in the north and in Ireland.

VERTIGO PYGMÆA Draparnaud. 70

Shell minute, ovate, cylindrical, somewhat ventricose, glossy, a little translucent, very faintly striated. Reddish-brown. Whorls five, rounded. body-whorl conprising about one half of the shell. Suture well defined. Spire shortish, blunt. Aperture almost semi-oval, with five teeth—three palatal (inside the outer lip), one columellar, and the fifth, which is very obscure (often obsolete), lies at the base of the penultimate whorl. Peristome reddish, reflected but not broadly so. Umbilicus narrow, deepish. Diameter 1 to 2 mill., height 1·9 to 2·5 mill. Animal dark-grey above, paler below.

HABITAT. Under stones, logs, &c., and amongst the roots of grasses. The commonest of our native members of the genus.

v. **quadridentata** Studer: Shell with only two palatal denticles.

v. **pallida** Jeffreys: Shell thinner, light brown in colour.

VERTIGO LEVENENSIS Scott.*

Shell very minute, somewhat oval, tumid, smooth and polished. Whorls four-and-a-half, convex, more rounded on the lower side. Suture distinct. Apex and spire blunt. Aperture small, rounded, scarcely if at

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*Mr. Santer Kennard has kindly given us the synonymy of this species:

"Vertigo parcedentata (Al. Br.) =Vertigo genesii Gred. =Vertigo concinna Scott. =Vertigo levenensis Scott. The first named stands, but our form is the var. genesii."

all flexuous as in V. pygmæa, simple, entirely destitute of denticles. Diameter 1 mill., height about 2 mill.

From the post tertiary marl at Kirkland, Leven. Described by Mr. Thomas Scott, F.L S., in the Scottish Naturalist, 1891, p. 53, also in Proc. Roy. Phys. Soc. Edin., vol. x, p. 334. Mr. Scott remarks that it occurs in this deposit as a moderately common shell. It closely resembles V. pygmæa in size and shape, but is "destitute of teeth, not even a trace of a tooth being observed in the most perfect of the shells."

VERTIGO MOULINSIANA Dupuy. 6

Shell minute, oval, glossy, not striated, thin, yellowish. Whorls four, the last occupying more than half the shell, very tumid, globose. Suture deep. Spire blunt. Aperture almost elliptical, armed with four or five denticles—one on the body, one near the columella, and two or three inside the outer lip. Peristome stout, whitish. Umbilicus distinct. Diameter 1·25 to 1·75 mill., height 2 to 2·25 mill. Animal greyish. "The shell of V. moulinsiana is rather more swollen than that of V. lilljeborgi, and the labial rib is much stouter." Dr. Gwyn Jeffreys in Annals and Mag. Nat. Hist. Nov. 1878.)

HABITAT. Under stones and logs in moist situations. Hitherto found only in Hants., S. Herts., Cambridge, Lincoln, Leicester, and Rutland.

v. **bidentata** Jeffreys: Aperture with only two denticles, labial or palatal teeth wanting.

VERTIGO LILLJEBORGI Westerlund. 1

Shell minute, oval, very thin and glossy. Light yellowish horn-colour. Whorls four-and-a-half, globose, very tumid, body-whorl larger than the rest of the shell. Suture very deep. Spire short with a blunt apex. Aperture semi-oval, armed with four denticles, one on the lip of the columella, one on the middle of the columella itself, and two on the outer lip. The thin, reflected, outer lip has a white external rib. Umbilicus distinct. Diameter 1 to 1·25 mill., height 2 to 2·25 mill. Animal darkish grey above, paler below. "The species differs from V. antivertigo in being larger, more ventricose, in the mouth and lip not being contracted, and especially in the number and position of the teeth which never exceed four. From V. pygmæa by being twice the size, and very much more ventricose. V. Lilljeborgi* resembles V. antivertigo in form, and V. pygmæa in the number of teeth. It is amongst the largest of our native species of Vertigo" (J. Gwyn Jeffreys).

HABITAT.—Ballinahinch, near Roundstone, co.. Galway. Under stones by the side of a small lake. Found by Dr. Gwyn Jeffreys in 1845. The only known British station.

VERTIGO ALPESTRIS Alder. 3

Shell minute, sub-cylindrical, strongly striated in the line of growth, glossy, semi-transparent, olivaceous-yellow or light horn-colour. Whorls four-and-a-half, convex. Suture very deep Spire short with blunt apex. Aperture semi-oval, sub-angular, armed with four denticles which may be seen through the thin shell, one on the columella, two inside the outer lip, and one on the body-whorl. Umbilicus small, deepish. Diameter1 to 2 mill., height 2 to 2·5 mill. Animal darkish grey above, paler below. Foot and tentacles longer than in V. pygmæa.

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*Written V. monlinsiana in 'British Conchology.' Dr. Gwyn Jeffrey's description, however, agrees with that of Lilljeborgi.

HABITAT. Amongst grass and dead leaves in the northern counties of England. A rare species, possibly often overlooked owing to its minute size.

VERTIGO HELDI Clessin.

"Shell rimate, turreted,* irregularly and very finely striate. reddish-brown, glossy. Whorls six, slowly increasing, somewhat arched; the first three form the blunt apex of the shell, the last three are almost identical in height, and form the remaining cylindrical portion; the last whorl is neither swollen nor contracted before the mouth. Mouth about one-fourth the length of the shell, somewhat compressed on the outer side, in such a way that the compressed part is prolonged for a short distance over the last whorl in the form of a deep channel; teeth very small, reddish, deeply inserted—one parietal, one columellar, two palatals very small or sometimes absent; periphery continuous, only slightly thickened. Length 2·5 mm., breadth 1·2 mm. Habitat.—Hitherto only found dead in the rejectamenta of the rivers Danube and Jaget. This species is well marked by its size, colouring and shape, and, though it recalls V. pygmæa in dentition, is very strikingly distinct from that species in every other respect."†

HABITAT. Near Ballintoy, co. Antrim. A single living specimen was found by Mr. J. R. le Brocton Tomlin in September 1901 (J.C., vol. x, no. 10, April 1903).

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* Westerlund amends "turreted" to "cylindrical" ("Binnecouch," iii, 133).

† Clessin's description, Nachr.-Bl. Mal. Ges., 1877, p. 48, and "Deutsche Exk-Fauna" ed. 2, p. 266.

VERTIGO PUSILLA Müller. 21

Shell minute, sinistral, ovate, somewhat fusiform, very glossy, thin and transparent, indistinctly striated in the line of growth. Uniformly fulvous or pale yellowish horn colour. Whorls five, the last being broadest, very ventricose. Suture deep. Spire somewhat more tapering than in its allies, apex obtuse. Aperture semi-oval or sub-quadrate, contracted in the outer margin, armed with six or seven teeth—two on the base of the penultimate whorl, two on the columella (sometimes three), and two inside the outer lip. The thickish lip, which is only very slightly contracted, has both externally and internally a strong yellowish-white rib. Umbilicus small. Diameter 1 mill., height 2 mill. Animal dark grey above, paler below, mantle yellowish-brown.

HABITAT. Amongst damp moss and decaying vegetation in woods, on old walls and under stones.

v. **tumida** Westerlund: Shell small and ventricose.

v. **albina** Taylor: Shell white.

VERTIGO ANGUSTIOR Jeffreys. 13

Shell minute, sinistral, fusiform, glossy, and semi-transparent, closely striated in the line of growth. Reddish-fulvous or horn-colour. Whorls four-and-a-half, slightly ventricose, the penultimate being the broadest. Suture deepish. Spire somewhat produced, apex very blunt. Aperture bluntly triangular, armed with four or five denticles—one on the columellar, one or two inside the deeply contracted outer lip, and two on the base of the penultimate whorl. Outer lip with a strong yellowish-white rib. Umbilicus indistinct. Diameter ·75 to 1 mill., height 1·75 to 2 mill. Animal darkish grey, with yellowish-grey mantle.

HABITAT. Roots of grasses in marshy and sandy places. A very rare and local species, possibly it is frequently overlooked owing to its minute size.

BALEA PERVERSA Linné. 69

Shell sinistral, fusiform, very thin, transparent, irregularly striated in the line of growth. Olivaceous or yellowish-horn colour. Whorls six to eight, moderately convex, the last rounded at the base. Suture deepish. Spire turreted, polished, not striated, apex blunt. Aperture angulated, pyriform, usually with a small parietal denticle near the base of the penultimate whorl. Outer lip thin, white, slightly reflected. Umbilicus a narrow chink. Diameter 2 to 2·75 mill., height 9 to 9·5 mill. Animal dusky-grey above, with a dark band on each side of the neck, foot-fringe and sole very pale grey. Immature shells may be easily distinguished from those of Clausilia bidentata by the absence of carination on the basal ridge.

HABITAT. Amongst moss on old trees, especially apple, beech, ash, and willow, gregarious.

v. **viridula** Jeffreys: Shell greenish-white, very glossy.

v. **simplex** Moquin-Tandon: Aperture without the parietal denticle.

CLAUSILIA LAMINATA Montagu. 48

Shell sinistral, fusiform, highly glossy, thin, minutely striated in the line of growth. Reddish or brownish horn-colour. Whorls eleven to twelve, compressed, suture shallow. Spire turreted, with obtuse apex. Aperture oval-pyriform or roundish-oval, provided with two strong denticles on the base of the penultimate whorl; and four deep-seated palatal plaits which may be easily discerned through the very thin and semi-transparent shell. Outer lip whitish, expanded but not reflected. Umbilicus slight. Clausilium oblong, with a marginal notch near its base. Diameter 3·8 to 4·2 mill., height 16 to 18 mill. Animal yellowish-brown, head and neck dusky, foot-fringe and sole pale.

HABITAT. Gregarious upon trunks of beech and ash trees, and amongst the leaves beneath them, on limestone soils, chiefly in the south of England.

v. **pellucida** Jeffreys: Shell very thin, glossy, and almost transparent.

v. **albina** Moquin-Tandon: Shell uniformly white.

CLAUSILIA BIPLICATA Montagu. 3

Shell sinistral, fusiform, slender, slightly transparent, with numerous well-raised and closely-set striæ, some of which are streaked with white. Reddish or greyish-brown. Whorls twelve to thirteen, compressed, basal crest, prominent. Suture shallow. Aperture sub-pyriform or ob-oval, canaliculated at the base, armed with a distinct sub-marginal denticle near the upper and two palatal folds near the middle of the outer lip, one much stronger than the other; sometimes there are minute denticles adjoining the folds. Outer lip whitish, raised all round, sub-labiated. Umbilicus broad and distinct. Clausilium almost oval, slightly curved, tapering below. Diameter 3·75 to 4 mill., height 16 to 17 mill. Animal dark grey, foot ashy-grey with white spots.

HABITAT. Woods and hedges. Very rare. Under the large osiers by the Thames at

Hammersmith; also Wilts.,* Surrey, and Herts.

v. **nelsoni** Jeffreys: Shell more slender, almost entirely devoid of striation, translucent, whitish above.

v. **albina** Moquin-Tandon: Shell white.

CLAUSILIA BIDENTATA Ström. 130

=CLAUSILIA PERVERSA Pulteney.
=CLAUSILIA RUGOSA Draparnaud.

Shell sinistral, fusiform, cylindrical, diaphanous, glossy, with close-set strong striæ in the line of growth. Chocolate-brown or horn-colour marked with whitish streaks. Whorls ten to thirteen, the last much contracted near its base. Suture oblique, bordered with white. Spire tapering to a blunt apex. Aperture small, pyriform, armed with several denticles—two on the base of the penultimate whorl, one acute and prominent, the other bifurcated and more deeply seated, occasionally there are small folds between them; two on the columella, one being indistinctly spiral, the other semi-lunar. Outer lip whitish, elevated, inflected. Umbilicus narrow. Clausilium oblong, oval. Diameter 2·54 to 3 mill., height 9·6 to 13·3 mill. Animal dark grey, mottled, foot-fringe and sole paler.

HABITAT. Walls, under stones on the ground, and on the trunks of beech, ash, and other trees. Generally distributed.

v. **cravenensis** Taylor: Shell large, more ventricose anteriorly. A well-marked form occurring in Yorkshire, Durham, and Northumberland. (=Clausilia dubia Jeffreys non Draparnaud.)

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*Why omitted in latest census? Montagu found it in Wilts.

v. **suttoni** Westerlund: Shell large, much elongated, smoother, pale brown, superficially resembling C. laminata. (= v. schlechtii Jeffreys.)

v. **glacilior** Jeffreys: Shell very long and slender.

v. **tumidula** Jeffreys: Shell small and short, more ventricose.

v. **parvula** Turton: Shell very small and slender, not ventricose.

v. **everetti** Miller: Shell short, whorls less than ten.

v. **albina** Moquin-Tandon: Shell whitish.

m. **dextrorsum**: Shell dextral.

CLAUSILIA PUMILA Pfeiffer.

Shell sinistral, fusiform, thin, slender, with numerous closely-set striæ as in C. biplicata, also with spiral striæ. Yellowish horn-colour or reddish-brown. Whorls twelve, compressed. Suture shallow. Spire attenuated. Aperture sub-pyriform, with a distinct denticle near the upper lip, also a well-pronounced sub-columellar fold, outer lip raised. Umbilicus distinct. Diameter 3 to 3·5 mill., height 12 to 16 mill.

HABITAT. *Well distributed in Europe. Kobelt records it from Sweden; Dr. Boettger has taken it at Görlitz in Silesia. Extinct in Great Britain. According to B. B. Woodward it is fairly common in the Barnwell deposit. It is figured in his paper on the Pleistocene L. and F. Mollusca from the Barnwell Gravels, in Proc. Geol. Assoc., vol. x, no. 7.*

CLAUSILIA ROLPHII Leach in Turton. 12

Shell sinistral, fusiform, glossy, thin, closely and strongly striated. Umber-colour or a reddish chocolate-brown, not streaked or variegated. Whorls nine to eleven, ventricose. Suture shallow, oblique. Spire regularly tapering, apex somewhat blunt. Aperture rounded, pyriform, armed with several denticles, that on the upper lip prominent, with one or two smaller ones near it, a well-pronounced semi-lunar fold on the pillar partially encloses a small fold just above it, between the folds there are small denticles. Peristome whitish, slightly raised, dilated. Umbilicus small. Clausilium oblong, curved, and contracted above. Diameter 3 to 3·5 mill., height 12 to 13 mill. Animal blackish-grey, upper tentacles black, lower paler, foot-fringe and sole greyish-white. The armature of the mouth resembles somewhat that of C. bidentata, but there are occasionally two or three denticles between the columellar folds; the lower fold is also less pronounced. The shell is always more ventricose and the mouth larger and broader than in that species. It is more spindle-shaped than the other members of the genus.

HABITAT. Dead leaves at the base of trees in woods, and under stones on the limestones and clays of the oolite and chalk in the southern counties of England. Rare.

v. **pellucida**: Shell transparent and colourless.

SUCCINEA PUTRIS Linné. 97

Shell ovate-oblong, very thin, glossy, transparent, and irregularly striated. Amber colour. Whorls three to four, body-whorl very large. convex, occupying at least five-sevenths of the shell. Suture strongly pronounced. Spire short, apex blunt. Aperture ovate, sub-vertical, about two-thirds the length of the shell. Outer lip not projecting abruptly above, and less arcuated than below. Diameter 8 to 10·25 mill., height 15 to 18 mill. Animal reddish-yellow, mottled with brown, sole pale. The larger size and blunt spire distinguish this species from S. elegans.

HABITAT. Herbage in marshy places, on the banks of ditches and pools.

- v. **subglobosa** Jeffreys: Shell short, solid, broader in proportion to its height.
- v. **stagnalis** Gassies: Small, front margin somewhat straight, sometimes greenish-bronze colour.
- v. **solidula** Jeffreys: Shell thick, reddish-yellow.
- v. **vitrea** Moquin-Tandon: Shell sub-oval, very thin and transparent, yellowish.
- v. **albida** Mörch: Shell white.

SUCCINEA ELEGANS Risso. 81

Shell oblong, smooth, glossy, semi-transparent, thin, and irregularly striated. Reddish-amber colour. Whorls three to four, convex, body-whorl very large. Suture strongly pronounced, especially so near to the mouth. Spire produced, apex pointed. Diameter 5 to 8 mill., height 8 to 14 mill. Animal yellowish-brown, blackish-purple or even black, its dark hue makes the shell appear bluish or black. Easily known from S. putris by its smaller size, more elongated form, and the dark colour of the animal.

HABITAT. Herbage in marshy places and bogs. It affects moister situations than S. putris, and may not infrequently be found crawling on the submerged stems of plants.

v. **longiscata** Morelet: Shell elongated, aperture much compressed.

v. **pfeifferi** Rossmäsler: Shell slightly curved at the extremities, pale yellow, whorls three, body-whorl occupying nearly the whole of the shell, spire short, apex tuberculate, suture not deep.

v. **virescens** Morelet: Shell very thin, concentrically striated, greenish-yellow, columella whitish, spire very short.

v. **ochracea** Betta: Shell small, thick, with long spire and small aperture.

v. **albida** Taylor: Shell white.

m. **sinistrorsum**: Shell sinistral.

SUCCINEA OBLONGA Draparnaud. 11

Shell small, oval, ventricose, rather thin. Reddish horn-colour. Whorls four, convex, particularly tumid. Suture deepish, periostracum often thick. Spire rather elongated, apex blunt. Aperture oval or sub-ovate, not occupying more than half the total length of the shell. Diameter 2 to 4 mill., height 6 to 8 mill. Animal varying from light brown to black, tentacles and sole pale. Known from the other members of the genus by its much smaller size, superficially resembling Limnæa truncatula from which it may be at once recognised by the absence of the reflected lip on the columella.

HABITAT. Edges of ditches and on sandhills near the coast. A rare and local species. Has been recorded from Somerset, Devon, Yorkshire, Glasgow. and Cork.

v. **arenaria** Bouchard: Shell very finely striated, spire very swollen and slightly twisted. Suture very deep. Aperture rounded-oval, in length exceeding one half the total length of the shell. Diameter 5 to 6 mill., height 6 to 8 mill.

v. **alba** C. E. Wright: Shell pure white.

m. **sinistrorsum**: Shell sinistral.

CARYCHIUM MINIMUM Müller. 95

Shell very minute, fusiform, oblong, glossy, delicately striated transversely. Whitish or yellowish-white. Whorls five to five-and-a-half, body-whorl comprising almost one-half of the shell. Suture deepish. Spire pronounced, with an acute apex. Aperture auriculate, usually with three denticles—one on the inside of the outer lip, one on the columella, and the third on the centre of the penultimate whorl; not infrequently there are but two denticles. Peristome thick, reflected. Umbilicus an oblique chink. Diameter ·85 to 1 mill., height 1·95 to 2 mill. Animal yellowish-white, with prominent black eyes, bi-lobed in front, rounded behind.

HABITAT. Under stones and sticks, and amongt moss and leaves, always in damp situations.

v. **tridentata** Risso: Denticles more pronounced.

PHYTIA MYOSOTIS Draparnaud.

Shell conical-oblong or oval, semi-transparent, more or less striated longitudinally. Yellowish-brown or chocolate-brown. Whorls six to seven, body-whorl in excess of half the shell. Suture not deep. Spire elongated, acute, in living specimens with minute hairs around the sutures of the upper whorls. Aperture oblong-lanceolate, narrowly rounded behind, with two or three denticles on the upper lip. Diameter 3 to 3·25 mill., height 6 to 7·5 mill. Animal yellowish-grey.

HABITAT. Under stones immediately above

high water mark near the mouths of rivers on the south and west coasts of England, but rarely in Ireland.

v. **denticulata** Montagu: Shell thin, aperture with two to four tooth-like folds on the pillar, and two or three tubercles of variable size on the thin outer lip.

v. **ringens** Turton: Shell whitish horn-colour, transparent, outer lip very thin, with four or five white teeth somewhat within the mouth but which are visible externally through the thin shell.

OVATELLA BIDENTATA Montagu.

Shell sub-fusiform-oval or oblong-conical, more or less solid, smooth, and glossy. Uniformly pale yellowish horn-colour. Whorls six or seven, slightly convex, the body-whorl occupying more than one half the shell. Suture small. Spire produced, apex blunt. Aperture semi-ovate, peaked above, shortly rounded below, with two folds—an oblique one at the lower extremity of the columella, and a somewhat horizontal one below. There are no denticles on the upper or parietel portion. Diameter 2·75 to 3 mill., height 6 to 6·2 mill. Animal creamy-white, with very short angular tentacles.

HABITAT. Crevices of rocks near high-water mark. Chiefly on the south-western coasts of England and Ireland.

v. **alba** Turton: Shell small, fusiform, slightly transversely striated, thin, pellucid, white, mouth oblong, slender.

ANCYLUS FLUVIATILIS Müller. 105

Shell conical, with recurved point, thin, more or less elevated, with strongly marked striæ which radiate from the apex, and minutely striated in the line of growth. Yellowish-grey or light horn-colour. Apex excentral, acutely peaked and hooked. Aperture ovate, not exceeding 6 mill. in width. Length 5·9 to 7·8 mill., width 4·3 to 6·5 mill., height 3·5 to 5 mill. Animal darkish-grey, spotted with black, tentacles obtuse, foot ovate oblong.

HABITAT. Stones in streams and rivers, sometimes attached to the shells of Unios and Anadons. Always in running water.

- v. **capuloides** Jan: Shell elevated, large, aperture oboval, rounded.
- v. **gibbosa** Burgeois: Shell but slightly elevated, small, extremely convex, apex obtuse, overhanging the posterior margin.
- v. **stricta** Morelet: Shell much elevated, very convex in front, laterally compressed hence with narrow elliptical aperture.
- v. **albida** Jeffreys: Shell milk-white, more finely striated.

ACROLOXUS LACUSTRIS Linné. 5.8

=ANCYLUS LACUSTRIS Linné.

Shell sinistral, semi-ovate, extremely thin, glossy, semi-transparent. Olivaceous-yellow or pale horn-colour. Apex acutely peaked and hooked, sub-central, bending to the left. Sides compressed. Aperture ovate, sub-oblong. Length 5·15 to 6 mill. Animal dark grey or greenish-yellow, spotted with black, tentacles white, obtuse.

HABITAT. Lakes, ponds, and canals (never swiftly running streams) on the stems and leaves of water plants, and on submerged branches.

- v. **compressa** Jeffreys: Shell large, very broad and very flat.
- v. **moquiniana** Bourguignat: Shell elevated, very convex anteriorly, apex more crooked, somewhat obtuse, laterally compressed, hence with narrow elliptic aperture.
- v. **albida** Jeffreys: Shell milk-white, with a greyish periostracum.

LIMNÆA AURICULARIA Linne. 60

Shell more or less globosely ovate, semi-transparent, glossy, with deep and irregular lines of growth. Yellowish horn-colour. Whorls four to five, the last being much swollen and very large, usually occupying five-sixths of the shell. Suture obliquely curved. Spire extremely short and acute. Mouth enormously expanded, rounded-oval, outer lip very prominent, inner lip much reflected, not appressed, with the more or less open umbilical chink behind it. Fold of the columella strongly curved. Diameter 16 to 24 mill., height 18 to 32 mill. Animal greenish-yellow, spotted or mottled with black, white, and yellow. "It is the combination of characters. most of which are separately present in the preceding species (L. peregra) that constitutes the specific individuality of L. auricularia. For one of the many forms of pereger displays the capacious aperture, another that peculiarly rapid volutional increase which effects the disproportion between the penult and antepenult turns, a third the projecting anterior extremity, a fourth the curious twisted gibbous look of its body when examined at its left side. Yet collectively these characters give such an aspect to the species that even when the fold is imperfectly developed, no practical difficulty occurs in the determination of specimens." (Forbes and Hanley, Hist. Brit. Moll., vol. iv, p. 170, 1853.)

HABITAT. Lakes, ponds, marshes, sluggish rivers, and canals.

v. **acuta** Jeffreys: Shell small, more oblong, mouth less capacious.

v. **ampla** Hartman: Spire very short, aperture extending beyond the apex.

v. **reflexa** Nelson: Outer lip very much reflected.

v. **magna** Colbeau: Shell very large, aperture proportionately narrower, outer margin nearly parallel to the straight columella, upper edge level with the sharp spire.

v. **albida** Jeffreys: Shell small, very thin, spire short, striæ less distinct, white.

LIMNÆA PEREGER Müller. 134

Shell obliquely-ovate, thin and glossy, spirally striated. Horn-coloured, often coated with a ferruginous or greenish film. Whorls five, convex, body-whorl very large and ventricose. Spire raised, apex sharp. Aperture large, oval, more than half the length of the shell. Outer lip expanded, inner lip folded upon the columella, with a more or less narrow chink behind it. Diameter 12 mill., height 18 mill. Animal yellowish-olive or greenish-grey, mottled and spotted with black and white. An extremely variable species—some forms are difficult to distinguish from L. auricularia, others in stature and form resemble L. palustris. L. pereger is probably the ancestral form from which L. stagnalis, L. auricularia, L. burnetti, etc., have arisen.*

HABITAT. Rivers, canals, ponds, lakes, and springs throughout the kingdom.

v. **obtusa** Kobelt: Shell large, whorls very convex, rapidly increasing. The very large mouth is almost level with the apex of the very small spire. Diameter 35 mill., height 29 mill. It is very like L. auricularia.

v. **lacustris** Leach: Shell small, thin, and glossy, concentrically grooved, with a very short spire and large aperture. Diameter 6·5 mill., height 9 mill. Resembles L. burnetti in miniature.

v. **inflata** Kobelt: Shell large, ampullaceous, glossy, spire small, body-whorl ample, aperture large, pyriform. Diameter 20 mill., height 28 mill.

v. **patula** Da Costa: Shell large, very globular and inflated, whorls very convex, spire short, aperture ample. Diameter 21 mill., height 25 mill.

v. **ovata** Draparnaud: Shell large ampullaceous, glossy, rather thin, whorls very convex, suture deep, body-whorl very large, spire very short and acute, aperture pyriform. Diameter 16 mill., height 25 mill.

v. **stagnaliformis** Taylor: Shell large, somewhat fusiform, body-whorl very large. Diameter 18 mill., height 35 mill. The aperture is 25 x 13 mill.

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*See Mr. George Chaster's very interesting paper on "A cross between Limnæa stagnalis and L. auricularia," J.C., vol. ix, p. 282.

v. **acuminata** Jeffreys: Shell ampullaceous, rather thin, whorls convex, suture deepish, spire produced, aperture small. Diameter 13 mill., height 20 mill.

v. **intermedia** Férussac: Shell thin, rather compressed towards the front margin, spire produced, aperture expanded.

v. **oblonga** Jeffreys: Shell oblong, compressed in front. Diameter 10 mill., height 19 mill.

v. **boissyi** Dupuy: Shell small, globose, whorls convex, spire produced. Diameter 7·5 mill., height 12 mill.

v. **vulgaris** C. Pfeiffer: Shell small, whorls and apex less convex, spire less produced. Diameter 6 mill., height 14 mill.

v. **pulchella** Roffian: Shell very small, pale, lines of growth pronounced, aperture slightly margined. Diameter 5 mill; height 9 mill.

v. **succineiformis** Jeffreys: Shell very thin, rather small, shaped like a Succinea, whorls four, spire small, oblique. Diameter 6 mill., height 13·5 mill.

v. **maritima** Jeffreys: Shell very small, stout, suture deep, spire elongated. Diameter 5·5 mill., height 11 mill.

v. **microstoma** Kobelt: Shell slender, much elongated, aperture less than half the total length of the shell. Diameter 6 mill., height 13·5 mill. Somewhat resembles L. palustris in miniature.

v. **lutea** Montagu: Shell stout, sub-oval, sub-pellucid, dull orange-yellow, whorls three-and-a-half. Diameter 6 to 7 mill., height 10 to 11 mill.

v. **diaphana** Parreyss: Shell very thin and transparent.

- v. **picta** Jeffreys: Shell marked by alternate bands of brown and white, which are sometimes confluent.
- v. **candida** Porro: Shell pure white.
- v. **lineata** Bean: Shell oblong, ovate, sub-ventricose, with ten or twelve short (often forked) raised lines on the body-whorl, hence causing it to appear angular; these ribs are crossed by numerous longitudinal striæ, spire short, acute, inner lip thin forming a small chink behind it. Diameter 6 to 8 mill., height 10 to 12 mill.
- v. **labiosa** Jeffreys: Shell with a remarkably expanded and reflected outer lip, sometimes to such an extent as to make the margin almost completely tubular. Diameter 14 mill., height 16·5 mill.
- m. **sinistrorsum**: Shell sinistral.
- m. **scalariforme**: Whorls more or less disjointed.

LIMNÆA BURNETTI Alder. 2

Shell ovate-globose, thin, semi-transparent, more or less strongly striated in the line of growth, periostracum rather thick. Reddish-tawny or yellowish-brown. Aperture sub-pyriform, ovate, obliquely prominent, projecting chiefly below. The last whorl nearly covers all the others, hence appearing almost intorted. Spire involute from the first. Outer lip acute, inner lip thin, white, not adpressed but disclosing the umbilical chink. Diameter 12 mill., height 14 mill. Animal dark-olive, spotted with opaque yellow; mantle nearly black, with a few paler spots. A local race of L. pereger.

HABITAT. Lakes in Wales and Scotland only, viz., Loch Skene, Dumfrieshire, and Llyn y van fach, Breconshire.

LIMNÆA INVOLUTA Harvey. 1

Shell ovate, sub-globose, extremely thin and fragile, more or less glossy, transparent. Reddish horn-colour. Whorls three to four, body-whorl comprising the greater part of the shell. Suture shallow. Spire sunk below the apex of the body-whorl. Aperture large, pyriform, very broadly rounded, and a little reflected below. Columellar fold narrow. No umbilicus. Diameter 7 to 8 mill., height 9·75 to 10·5 mill. Animal dark yellowish-brown, with white specks on head, tentacles and foot. The embryo shell has not an involute spire. In the words of Messrs. Forbes and Hanley it is a "monstrous yet permanent variation of a more ordinary Limnæus," i.e., L. pereger.

HABITAT. A small alpine lake on Cromaglaun Mountain, near Killarney, Ireland.

LIMNÆA PALUSTRIS Müller. 93

Shell conic-oval, elongated, pointed, opaque, thick, strongly striated in the line of growth. Colour variable, yellowish, brownish horn-colour or dark violet-brown. Whorls seven, convex, more or less rounded, never angulated, the body-whorl occupying about two-thirds of the shell. Suture fairly deep. Spire, when not decollated, tapers gradually to an acute apex. Aperture ovate, outer lip stained with brown or chocolate colour. Diameter 8·7 to 10·5 mill., height 19·6 to 24 mill. Animal greenish-olive or yellowish-brown, marked with yellow and black spots.

The shell is frequently decollated through erosion of the upper whorls, occasionally turreted or carinated.

HABITAT. Marshes, ponds, lakes, and canals.

- v. **corva** Gmelin: Shell large, swollen, sometimes 30 mill. in height, outer lip violet-coloured within.
- v. **obesa** Taylor: Shell remarkably obese, diameter 14·5 mill., height 23 mill., of type specimen.
- v. **elongata** Moquin-Tandon: Shell small, transparent, fawn, whorls more convex, suture deep.
- v. **conica** Jeffreys: Shell conic, whitish, with deep suture, also umbilical cleft.
- v. **tincta** Jeffreys: Shell short and broad, lightish brown with purple mouth.
- v. **lacunosa** Ziegler: Shell marked with pits and protuberances.
- v. **fasciata** Nelson: Size of type, but with three spiral dark brown bands on the body-whorl.
- v. **roseolabiata** Jeffreys: Shell with white or rose-coloured rib.
- v. **albida** Nelson: Shell white.

LIMNÆA TRUNCATULA Müller. 109

Shell small, oblong-conic, turreted, thin, glossy, strongly striated in the line of growth. Pale brown or yellowish horn-colour. Whorls five to six, roundly inflated, deeply separated from one another, body-whorl occupying about three-fifths of the total length. Suture very deep. Spire produced, apex acute. Aperture ovate-oblong, nearly half as long as the shell, occasionally tinged with chestnut-brown. Outer lip arcuated.

Umbilical chink distinct. Diameter 3·8 to 5 mill., height 7·9 to 10 mill. Animal pale brownish-grey or nearly black. The smallest British representative of the genus. The very deep suture which gives the shell a peculiar turreted appearance differentiates it from certain small forms of the preceding species.

HABITAT. Banks of ditches, canals, streams, rivers, and pools.

v. **ventricosa** Moquin-Tandon: Shell very ventricose, spire short, peristome without swelling.

v. **elegans** Jeffreys: Shell very large, solid, with coarse spiral ridges, greyish-white, spire much elongated, suture oblique, outer lip thickened.

v. **microstoma** Drouët: Shell small, whorls convex, spire elongated, aperture small and narrow.

v. **albida** Jeffreys: Shell small, milk white.

m. **scalariforme**: Shell small, whorls nearly disunited.

LIMNÆA STAGNALIS Linné. 65

Shell turreted, oblong-oval or acuminated-ovate, semi-transparent, thin and brittle. Horn-colour, sometimes pallid, and sometimes brownish. Whorls seven to eight, convex, the last one very large occupying almost three-quarters of the shell. Suture deep. Spire produced, tapering to a fine point. Aperture oval, capacious. The greatly curved columellar fold is prominent, inner lip entirely reflected, not forming an umbilicus. Diameter 18 to 27·4 mill., height 35 to 50 mill. Animal yellowish-olive, with brown and whitish specks. The largest member of the genus.

HABITAT. Ponds, lakes, and slow running streams and canals.

- v. **fragilis** Linné: Shell small, narrow, and very thin, amber-colour.
- v. **bottnica** Clessin: Shell small, dark, with deep suture.
- v. **lacustris** Studer: Shell very ventricose, spire short.
- v. **labiata** Jeffreys: Shell with outer lip much expanded.
- v. **variegata** Hazay: Shell variegated with opaque white markings.
- v. **albida** Jeffreys: Shell small, very thin, pure white.
- v. **umbilicata** Hutton: Aperture elongated, umbilicus present. (J.C. Jan. 1905, vol. xi, p. 144.)
- m. **sinistrorsum**: Shell sinistral.
- m. **scalariforme**: Whorls disunited.

LIMNÆA GLABRA Müller. 25

Shell sub-cylindrical, turreted, thin, somewhat glossy, smooth or with a few very minute longitudinal striæ. Pale horn-colour or brownish. Whorls seven to eight, slowly increasing, convex. Suture well defined. Spire tapering to a fine point. Aperture small, elongate-ovate, in length not exceeding one-third the height of the shell, whitish, and provided with a broad internal white rib. Umbilical chink very minute. Diameter 4 to 7 mill., height 14 to 25 mill. Animal dusky-grey, spotted with black.

HABITAT. Ditches and shallow pools in several of our southern counties, also in a few localities in the north of England and in Ireland. The rarest representative of the genus.

v. **elongata** Jeffreys: Shell slender with very elongated spire.

AMPHIPEPLEA GLUTINOSA Müller. 14

=LIMNÆA GLUTINOSA Müller.

Shell globosely-oval, very thin, almost membranaceous, transparent, striated in the line of growth and minutely so spirally. Uniformly very pale amber or yellowish horn-colour. Whorls three to four, much inflated, body-whorl forming the greater part of the shell. Suture deep. Spire slightly produced and very small. Aperture nearly oval, but much contracted above. Diameter 10 to 12 mill., height 13 to 15 mill. Animal pale yellow with bright yellow or white spots, mantle much dilated, almost covering the shell.

HABITAT. Ditches, ponds, and lakes. A local species, occurring only in the south-eastern counties, Windermere Lake, and Bala Lake.

v. **mucronata** Jeffreys: Shell not quite so globose, spire more produced.

v. **albida** Williams: Shell white.

PLANORBIS CORNEUS Linné. 42

Shell a circular coil, glossy, nearly opaque, obliquely striated. Greyish-olive or reddish-brown, usually lighter below. Whorls five to six, rounded above and below, rapidly increasing in size. Suture deep. Spire sunken. Periphery not keeled. Aperture semi-lunar, large, simple. Diameter 20 to 25 mill., height (thickness) 9 to 12 mill. Animal almost black, tinged with brown. The largest representative of the genus.

HABITAT. Canals, slow muddy streams, ponds, and ditches, chiefly in the South of England and the Midlands. It does not occur in Scotland, and but rarely in Ireland.

v. **albina** Moquin-Tandon : Shell white.

PLANORBIS ALBUS Müller. 80

Shell a flattened coil, very thin, pellucid, convex above, concave below, with minute longitudinal striæ, and very minute closely-set circular striæ clothed with deciduous hairs. Whitish or pale horn-colour, often appearing dark through dirt. Whorls five, the last one very much enlarged. Spire depressed. Aperture roundish-oval, receding below. Diameter 5 to 7 mill., height (thickness) 1·5 to 2·5 mill. Animal of variable colour, usually greyish-brown with pale grey tentacles.

HABITAT. Ponds and lakes, on water plants. Widely distributed.

v. **draparnaldi** Sheppard : Shell closely striated in the line of growth, periphery with a distinct keel.

v. **sulcata** Taylor: Shell with many strong curved ridges in the line of growth, sometimes thirty on the last whorl.

m. **scalariforme** : Whorls turreted, resembling a screw.

PLANORBIS STROEMI Westerlund.

Shell a flattened coil, strongly striated in the line of growth. Dusky horn-colour above, greenish-white below. Whorls four-and-a-half, rapidly increasing, both sides almost equally faintly convex, slightly *angular at the periphery. Aperture rounded-oval. Diameter 7·5 to 8 mill., height (thickness) 2 mill. Possibly identical with Helix Draparnaudi, Sheppard.*

HABITAT. *Norway, Lapland, Finland, and Siberia. In Denmark it occurs in deposits of the Bronze Age (A. C. Johansen). In this country it occurs only in the fossil state; commonly in the Thames and Lea alluvial beds (A. S. Kennard). It is described by B. B. Woodward in Proc. Geol. Assoc. vol. xi, pp 339-340 (as a keelless form of Planorbis carinatus, Müller) from dried "Thames Mud" of the Embankment on the site of the New Scotland Yard; from the Holocene gravels of the same spot, and from the Houses of Parliament; also from Betteridge Road, Fulham; Kew; Staines; the Lea Valley; and Clifton Hampden, Oxfordshire.*

PLANORBIS ARCTICUS Beck.

Shell a flattened coil, depressed above, concave below. Yellowish horn colour or whitish, often with pairs of dark stripes. Whorls three to four, convex, very indistinctly angular in the periphery. Aperture obliquely oval, interior often milky-white and thickened. Diameter 5 mill., height (thickess) 2 mill.

HABITAT.—*Lapland, Norway, Finland, Siberia, Greenland, etc. Extinct in Britain, occurring only in the Pleistocene deposits.*

PLANORBIS GLABER Jeffreys. 37

=PLANORBIS PARVUS Say.*

Shell convex above, depressed in the centre, concave below, very thin, semitransparent, glossy, with very faint transverse striæ. Pale olivaceous or brownish horn-colour. Whorls four-and-a-half to five, rounded, rapidly increasing, the body-whorl occupying nearly one half the shell. Suture very deep. Aperture nearly circular. Umbilicus large. Diameter 5 to 6 mill., height

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*Mr. B. B. Woodward does not consider P. parvus and P. glaber to be one and the same species. In this view he is supported by Mr. W. H. Dall, who writes "Plan. glaber Jeffreys in my opinion is distinct from P. parvus. The latter is flatter and less deeply umbilicated, and shows much more of the whorls within the outer one. It is also distinctly less polished in the average specimen."

(thickness) 1·5 to 2 mill. Animal yellowish-grey. Differs from P. albus in its smaller size, more rounded whorls, and the absence of strong spiral striæ.

HABITAT. Marshes, lakes, and ponds, chiefly in the northern counties.

v. **compressa** Lloyd: Shell compact, more concave below, whorls rounder and narrower, not increasing so quickly as in the type.

PLANORBIS CRISTATA Linné. 65

=PLANORBIS NAUTILEUS Linné.

Shell very small, quoit-shaped, depressed, thin, fragile, sub-pellucid, not glossy, flat above (a little concave in the centre), convex below, periphery faintly keeled. Olivaceous horn-colour or whitish. Whorls three, the outer one very large, and strongly marked with transverse ridges. Suture very deep. Aperture rounded, oval. Umbilicus large. Diameter 2·5 to 3 mill., height (thickness) 1 to 1·5 mill. Animal pale grey, with minute dark spots. The smallest member of the genus.

HABITAT. On aquatic plants in ditches and ponds.

v. **lævigata** Adami: Shell without ridges.

PLANORBIS DILATATUS Gould.

"The shell is about the same size as P. nautilus, which may be considered its nearest ally; but it has one whorl less, the periphery is angulated, the underside is remarkably gibbous, the mouth is very large, squarish, and scarcely oblique; the outer lip is expanded ("so as to make it trumpet-shaped" Gould), and the umbilicus is abruptly contracted, small, and deep. Body dark grey, often with a slight orange tint, closely and minutely speckled with flake white; mantle thick, lining the mouth of the shell; head large and tumid; mouth furnished with broad lobular lips; tentacles cylindrical and extensile, widely diverging, broad and triangular at the base. The sheath, or outer part, is gelatinous, and the core, or inner part, is of a much darker colour, and apparently greater consistence; tips rounded; eyes sessile on the inner base of the tentacles; foot oblong, squarish in front and bluntly pointed behind; verge curved on the left hand, or umbilical side of the shell."—Dr. Gwyn Jeffreys, Ann. and Mag. Nat. His., November, 1869.

HABITAT. The canals round Manchester, Burnley, and a few other cities in Lancashire. It was introduced from America in cotton bales about the year 1869.

PLANORBIS CARINATUS Muller. 55

Shell a flattened coil, slightly concave above and below, thin, glossy. Yellowish horn-colour. Whorls five to six, rapidly enlarging, the diameter of the body whorl near the aperture being nearly one-third of the whole, body-whorl sharply keeled in the centre. Suture deep. Mouth obliquely oval, angulated laterally. Umbilicus small, central. Diameter 11 to 14 mill., height (thickness) 2·5 to 3 mill. Animal reddish-brown or yellowish, with indistinct black spots. The broader whorls and keel in the middle line separates this species from P. umbilicatus.

HABITAT. Ponds, canals, and slow running rivers, chiefly in the South of England.

v. **disciformis** Jeffreys: Shell very flat and thin, body-whorl very large; keel very pronounced, and placed exactly in the median line.

v. **albida** Hudson: Shell white.

PLANORBIS UMBILICATUS Müller. 73

=PLANORBIS COMPLANATUS, Jeffreys.
=PLANORBIS MARGINATUS Draparnaud.

Shell a flattened coil, slightly concave above, flat below, except for a central depression, neither very thin nor glossy, with minute transverse striæ. Brownish or olivaceous horn-colour. Whorls five, ventricose, rapidly enlarging, the diameter of the body-whorl being one-fourth of the total diameter. Periphery strongly keeled, abruptly arched above the keel, almost horizontally convex below. Aperture rhomboidal, frequently with internal ribs. Umbilicus very shallow and large. Diameter 15 to 18 mill., height (thickness) 2·75 to 3·75 mill. Animal dusky, deep violet-red or almost black.

HABITAT. Ponds, canals, slow running rivers, and ditches.

v. **rhombea** Turton : Shell small, more convex above, deeply concave below, bluntly keeled.
v. **albina** Jeffreys : Shell white.
m. **sinistrorsum** : Shell sinistral.
m. **scalariforme** : Whorls turreted (Tate's Brit. Moll., p. 215).

PLANORBIS VORTEX Linne. 57

Shell a flattened coil, extremely compressed, thin, transparent, minutely and regularly striated in the line of growth. Glossy horn-colour. Whorls usually six (sometimes seven or even eight), narrow, slowly increasing in size, body-whorl sharply keeled on its lower margin. Suture deep. Aperture rhombic, compressed, angulated by the keel. Umbilicus large and shallow. Diameter 7 to 9 mill., height (thickness) 1 to 1·25 mill. Animal violet-brown, with yellowish-grey tentacles.

HABITAT. Aquatic plants in ponds, slow streams, and ditches.

v. **compressa** Michaud : Shell extremely thin and flat, keel very distinct and sharp, placed nearly in the median line.

PLANOBIS VORTICULUS Troschel.

Shell a flattened coil, flat above, the body-whorl rather higher than the others, broadly and deeply concave below, thin, brownish horn-colour. Whorls five, gradually increasing in size, convex above, flattened below, the body-whorl very slightly angular. Aperture rhombic, compressed. Umbilicus large and shallow. Diameter 3·25 to 4·75 mill., height 1 to 1·5 mill.

HABITAT. *Germany and Sweden, rare in the living state. Extinct in Britain, occurring only in Pleistocene deposits.*

PLANORBIS SPIRORBIS Linne. 84

Shell a flattened coil, concave above, flat below, or with both discs concave, rather thick, glossy. Rusty-brown or horn-colour. Whorls five to six, very narrow, rounded, very slowly increasing, body-whorl faintly keeled on the lower margin. Aperture roundish, not markedly angulated by the keel. Umbilicus wide and shallow. Dia- 5 to 6 mill., height (thickness) 1 to 1·5 mill. Animal yellowish-grey, tinged with black. It is not so flat as P. vortex, and may also be at once distinguished from that species by the faint carination and smaller size.

HABITAT. Amongst aquatic plants in ponds, canals, sluggish streams and ditches.

v. **ecarinata** Jeffreys: Shell small, whorls four, no trace of a keel.
v. **albida** Nelson: Shell white.
m. **sinistrorsum**: Shell sinistral.
m. **scalariforme**: Whorls disjointed or turreted.

PLANORBIS CONTORTUS Linne. 76

Shell a flattened coil, almost flat above, slightly concave in the middle, deeply concave below, solid, opaque. Yellowish or dull brown horn-colour. Whorls seven to eight, rounded, remarkably compact and narrow, slowly increasing, with minute transverse striæ. Suture deep. Aperture small, crescent-shaped, simple. Umbilicus large and deep. Diameter 5 to 5·7 mill., height (thickness) 1·5 to 2·5 mill. Animal dark grey or blackish.

HABITAT. Water plants in ponds, lakes, and ditches.

v. **albida** Jeffreys: Shell whitish.

PLANORBIS FONTANUS Lightfoot. 48

=PLANORBIS NITIDUS Müller, of Jeffreys.

Shell quoit-shaped, depressed, semi-transparent, thin and glossy, more convex above than below. Pale horn-colour. Whorls four to five, body-whorl very large, obtusely carinated at the periphery. Suture deepish. Spire depressed. Aperture small, horizontally compressed. Umbilicus small and shallow. Diameter 4·5 to 5·8 mill., height (thickness) 1·5 to 2 mill. Animal pale grey when young, adult reddish-brown.

HABITAT. Fallen leaves of trees, also aquatic plants in ponds, canals, and ditches.

v. **albida** Nelson: Shell white.

SEGMENTINA NITIDA Müller. 20

=PLANORBIS LINEATUS Walker.

Shell quoit-shaped, much depressed, highly polished, semi-transparent. Yellowish horn-colour or reddish-umber. Whorls four, the body-whorl very large and broad, with two to five transverse plates within, their site is marked on the exterior of the whorl by whitish lines. Periphery obtusely keeled. Mouth much compressed horizontally. Diameter 4 to 5 mill., height (thickness) 1·5 to 2 mill. Animal dark brown, spotted with black. Abundantly distinct in the nautilus-like septa.

HABITAT. On plants in ponds and sluggish streams, chiefly in the south-eastern counties.

v. **albina** Taylor: Shell transparent, milk-white.

PHYSA FONTINALIS Linné. 83

Shell sinistral, oval, semi-transparent, extremely thin and fragile, highly polished and smooth. Pale greenish horn-colour. Whorls four to five, the first three very small, body-whorl ventricose, occupying three-fourths of the shell, or even more. Suture deep. Spire extremely short, obtusely pointed. Aperture lanceolate, sub-pyriform, large, about three-fourths the total length, columella sinuate. Diameter 6·5 mill., height 12·5 mill. Animal yellowish-grey or blackish, mantle bilobed, the lobes being split into six and nine digitate processes respectively, which overlap the shell when expanded.

HABITAT Weeds in canals, ditches, and sluggish streams.

v. **inflata** Moquin-Tandon : Shell larger and more ventricose.
v. **curta** Jeffreys : Spire extremely short.
v. **oblonga** Jeffreys : Spire much elongated.
v. **albina** Jeffreys : Shell milk-white.
m. **dextrorsum** : Spire dextral (Dr. Williams' 'Shell Collector's Handbook,' p. 72).

PHYSA ACUTA Draparnaud.

Shell sinistral, elongated ovoid, somewhat glossy, very finely striated longitudinally. Light horn-colour or whitish. Whorls three to five, somewhat convex, body-whorl about three-fifths of the total length of the shell. Suture fairly deep. Spire short, with apex acuminate. Aperture large, obliquely oval, acute above. Diameter 7 to 9 mill., height 8 to 16 mill. Animal dark brown, with many black spots. Probably identical with Physa heterostropha Say.

HABITAT. One of the lily tanks in Kew Gardens ; warm water from mill at Aberdeen ; and a few other localities. Imported.

PHYSA HETEROSTROPHA Say.

Shell sinistral ovoid, ventricose, glossy, very finely striated longitudinally. Light horn-colour, yellowish-chestnut near the aperture. Whorls five, the last very large, six-sevenths the total height of the shell. Suture whitish, moderately deep. Spire short, apex acute. Aperture large, about three-fourths the length of the shell, obliquely oval, acute above. Lip thickened internally, tinged dull red, externally the rib is whitish. Diameter 7·5 to 11 mill., height 14 to 18 mill. Animal deep brown, with numerous black spots. Very near to Physa acuta According to Lionel Adams (see J.C., April 1905) the species are inseparable.

HABITAT. Pools near Bath, Birmingham, and Wednesbury, in company with Limnæa pereger. Imported.

APLECTA HYPNORUM Linné. 56

=PHYSA HYPNORUM Linné.

Shell sinistral, fusiform, thin, very glossy, semi-transparent. Yellowish or reddish horn-colour. Whorls six to seven, rounded, the body-whorl larger than the rest of the shell. Suture shallow. Spire elongated, apex obtuse. Aperture oblong-lanceolate, rather more than half the total length. Columella white, somewhat raised. Diameter 3·5 to 5 mill., height 8·5 to 13·5 mill. Animal deep brown or blackish, mantle simple, not reflected over the shell.

HABITAT. Weeds in ponds, ditches, canals, and sluggish streams.

v. **rubra** Tryon: Shell dark red.

PALUDESTRINA CONFUSA Frauenfeld.

=HYDROBIA SIMILIS non Draparnaud.

Shell ovoid, tumid, thin, sub-opaque. Yellowish or pale horn-colour. Whorls five to six, convex, rapidly increasing, body-whorl occupying more than half the shell. Sutures grooved, very deep. Spire produced, apex obtusely pointed. Umbilicus small, narrow, oblique. Aperture sub-pyriform. Operculum horny, spirally grooved, nucleus lateral. Diameter 3 mill., height 4 mill. Animal dark grey, mottled yellow or brown, and spotted with white. Mr. B. B. Woodward writes "Hydrobia similis, Draparnaud, having, as pointed out by Frauenfeld, a concentric operculum, whereas the form that has usually passed under the name has a spiral one, the two must be considered distinct" (J.C. vol. x, p. 364).

HABITAT. Formerly in ditches between Greenwich and Woolwich, which are flooded by the tide, but is now extinct there, owing to the pollution of the Thames. It still lives in France.

PALUDESTRINA JENKINSI Smith. **20**

Shell conical, tapering, semi-transparent, glossy, somewhat solid, minutely striated in the line of growth. Amber-colour or yellowish. Whorls five to six, body-whorl large, more than half the shell. Spire elongated, apex acute. Aperture sub-pyriform, angulated above, simple, its rim definitely raised everywhere. Umbilicus a shallow chink. Operculum horny, concentric. Diameter 2 to 3 mill., height 4 to 5·5 mill. Animal dark grey.

HABITAT. Brackish waters in estuaries and tidal canals.

v. **carinata** Smith: Shell with a thread-like keel on the periphery of the whorls. With the type, and equally abundant.

If there are minute spikes irregularly distributed around the keel it is the sub-variety aculeata, Overton ('Journal of Malacology, vol. xii, 1905).

PALUDESTRINA TAYLORI Smith. 2

Shell ovate, thin, opaque, glossy, rather solid, smooth not striated. Pale horn-colour. Whorls four, gradually increasing, body-whorl fairly large. Spire very short, apex blunt. Aperture oval, rim definite, except on the base of the body-whorl. Operculum horny, concentric. Animal oviparous. Possibly identical with Bithynella (Hydrobia) steeni, v. Martens, but is said to differ well from that species in its more conical broader form: The blunt spire, also the oviparous habit of the animal* would make it appear that this species belongs to the North American genus Amnicola. The species of Paludestrina are acute-spired and viviparous.

HABITAT. The canal near Fairfield Locks, Droylsden, Lancashire, and the Peak Forest Canal at Dunkinfield, Cheshire.

PALUDESTRINA VENTROSA Montagu.

=HYDROBIA VENTROSA Montagu.

Shell conical, thin, glossy, semi-transparent. Yellowish horn-colour. Whorls six to seven, tumid. Sutures not grooved. Spire elongated, apex acute. Aperture oval. Umbilicus very small, narrow, oblique. Operculum horny, concentric, nucleus lateral. Diameter 1·25 to 1·75 mill., height 1·5 to 2·75 mill. Animal dark grey, with black and whitish rings round the tentacles.

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* "Observations on the habits and reproduction of Paludestrina Taylori," by John W. Jackson and Fred Taylor in J.C. vol. xi, p. 9.

HABITAT. Brackish waters.

- v. **ovata** Jeffreys: Shell very short, only four whorls, very tumid, last whorl much in excess of one half of the shell, suture very deep.
- v. **elongata** Jeffreys: Spire elongated, sometimes there are eight whorls.
- v. **pellucida** Jeffreys: Shell clear white, almost transparent.

PALUDESTRINA STAGNALIS Basier.

=HYDROBIA ULVÆ Pennant.

Shell an elongated cone, opaque, smooth. Deep reddish-brown or yellowish-olive. Whorls four to six, body-whorl ventricose, occupying one-half of the shell. Suture narrow. Spire produced, apex acute. Aperture oval. Inner lip reflected "but is not succeeded by any real umbilicus, although a sub-umbilical crevice is generally present." Operculum ovate, horny. Diameter 3 to 5 mill., height 5 to 7 mill. "Size of a grain of wheat" (Pennant). Animal "varies in colour from a dull translucent white through every shade of dusky to nearly black."

HABITAT. Brackish waters.

- v. **tumida** Marshall: "Shell forming a short cone, with a spire of 4 or 5 convex whorls, and a necessarily deeper suture, the body-whorl being abnormally large, with no trace of a keel" (J.C. vol. 7, p. 252). Superficially resembles H. ventrosa v. ovata.

- v. **albida** Jeffreys: Shell white.
- v. **barleei** Jeffreys: Shell more cylindrical, aperture remarkably contracted.
- v. **octona** Linne: Shell very slender, base narrow. Superficially resembles H. ventrosa v. elongata.

PALUDESTRINA MARGINATA Michaud.

=Bythinia marginata Moquin-Tandon.

Shell turreted, elongate, very little swollen at the base, superficially almost smooth, but very closely and delicately striated longitudinally when viewed under a powerful lens, somewhat glossy, thin, fragile, and transparent. Very pale horn-colour. Whorls five-and-a-half to six, convex, slightly depressed towards the suture, the body-whorl forming half the shell. Suture very profound. Spire produced, apex slightly obtuse. Aperture almost round, slightly angular above. Umbilicus very small and narrow. Operculum deeply sunken, very thin, transparent. Diameter ·25 to ·75 mill., height 2 to 2·5 mill.

HABITAT. Germany, France, etc. Extinct in Britain, occurring only in Pleistocene deposits.

PSEUDAMNICOLA ANATINA Draparnaud.

Shell conical, thin, opaque, not glossy, rather solid, smooth not striated. Pale horn-colour. Whorls five to six, the body-whorl very large and tumid, occupying at least three-quarters of the shell. Suture broad and deep. Lines of growth well defined. Spire very short, apex obtuse. Aperture oval, large, rim either quite free or just touching the base of the body-whorl. Umbilicus large and deep. Diameter 2 to 2·5 mill., height 3 mill. Mr. J. R. le Brocton Tomlin, who was the first to record this species for Britain, wrote* "Dr. Boettger questions its distinctness from Paludestrina similis, Drap., and says that he finds great difficulty in separating the two forms. If our recently extinct species from the Thames marshes is really the P. similis of Draparnaud, I do not follow him in this. P. similis with its large swollen body-whorl and short spire seems abundantly distinct from P. anatina, which has a moderate body-whorl, and a longer and somewhat turreted spire."

HABITAT. Oulton Broad, Suffolk. Found by Mr. Claude Morley amongst lacustrine rejectamenta.

BITHYNIA TENTACULATA Linne. 85

Shell ovoid or ovate-acute, rather glossy, solid, sub-transparent. Reddish or yellowish horn-colour. Whorls five to six, the body-whorl large, equal to the rest collectively. Suture small but distinct. Spire produced, apex fairly acute. Aperture sub-pyriformly oval. Umbilicus none. Operculum sub-pyriformly oval, thick. Diameter 6·2 to 7 mill., height 9·6 to 12·7 mill. Animal dark brown or purplish, with yellow spots.

HABITAT. Ditches, streams, canals and sluggish rivers.

v. **producta** Menke: Shell less ventricose, in shape an elongated cone.

v. **ventricosa** Menke: Shell very ventricose, globosely-conical, white.

v. **excavata** Jeffreys: Whorls more rounded, suture deep.

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* J.C., vol. xi, p. 11.

v. **albida** Rimmer: Shell white.

BITHYNIA LEACHI Sheppard. 31

Shell conoid, very ventricose below, thin, semitransparent, glossy smooth. Uniformly yellowish horn-colour. Whorls four to five, very tumid, rounded, enlarging rather quickly. Suture deep. Spire short, apex acute. Aperture obliquely subcircular, much less angulated behind than in the preceding species. Umbilicus small, oblique. Operculum almost circular, flattish, with the nucleus in its centre. Diameter 4 to 4·5 mill., height 6 to 6·5 mill. Animal greyish-white with orange spots.

HABITAT. Ditches, canals, streams, and sluggish rivers.

v. **elongata** Jeffreys: Shell small, spire elongated.

v. **albida** Rimmer: Shell white.

VIVIPARA VIVIPARA Linné. 33

=Paludina vivipara Linné.

Shell conically oval, solid, not very glossy. Light yellowish-green, with three broad spiral bands of a brown colour on the body-whorl and two similar bands on the preceding whorls. Whorls six-and-a-half. Suture fairly deep. Apex blunt. Umbilicus merely a narrow chink. Aperture oval. Operculum moderately thick, horny. Diameter 22 to 28 mill., height 33 to 39·8 mill. Animal dark grey, mottled with copper colour, tentacles paler. The more oval form, less glossy appearance, and insignificant umbilicus, are distinguishing characteristics of this species.

Habitat. Lakes, ponds, canals, and sluggish rivers.

v. **albida** Nelson and Taylor: Shell white.
v. **efasciata** Pickering: Shell bandless. (=v. unicolor Jeffreys.)
v. **atropurpurea** Lloyd: Shell almost black, dark purple when viewed by transmitted light.
m. **sinistrorsum**: Shell sinistral.

VIVIPARA DILUVIANA Kunth.

=Vivipara clactonensis S. V. Wood.

Shell conical, thickened, somewhat angular. Whorls five to five-and-a-half, gradually increasing, body-whorl not greatly swollen. Suture deep. Spire blunt, apex obtuse. Aperture oval, inner lip reflected. Umbilicus elongated, narrow, deep. Diameter 18 to 19·5 mill., height 23 to 27 mill.

Habitat. *It was found by the Rev. O. Fisher in the Post-Glacial deposit at Clacton, Essex: also occurs in Pleistocene gravel at Swanscombe, Kent. It is figured in Searles V. Wood's Crag Mollusca, 2nd supplement (1878) Part I, Tab. I, fig. 4 a, b.*

VIVIPARA CONTECTA Millet 19

= PALUDINA CONTECTA Millet.

Shell ovate-conoid, very tumid, rather glossy, thin, semi-transparent, Dark olive-green, with three reddish-brown moderately broad spiral bands on the body-whorl, and two similar bands on the two preceding whorls. Whorls six to seven, tumid, quickly enlarging. Suture very deep. Spire short, apex pointed. Umbilicus narrow, but deep. Aperture obliquely rounded-oval. Operculum concave, thin, reddish-yellow, with minute concentric striæ. Diameter 22 to 30 mill., height 32 to 35 mill. Animal dark grey or blackish, with brilliant yellow spots.

HABITAT. Ponds, canals, and sluggish streams.

v. **virescens** Jeffreys: Shell greenish.

v. **atro-purpurea** F. Taylor: Shell uniformly dark purple, nepionic whorls bright translucent white (J.C. vol. xi. p. 144, Jan. 1905).

VALVATA PISCINALIS Müller. 83

Shell somewhat globular (orbicular-trochoid), thin, rather glossy, semi-transparent, finely striated in the line of growth, and occasionally with obscure spiral striæ. Pale horn colour, spire brownish. Whorls five to six, rounded, body-whorl very large. Suture very distinct. Spire short, apex obtuse. Aperture circular, peristome complete. Umbilicus deep, not very broad. Operculum circular, greyish-white. Diameter 6 to 7 mill., height 6 to 7·5 mill. Animal pale grey, speckled with white.

HABITAT. Aquatic plants in ditches, canals, and sluggish muddy streams.

v. **depressa** C. Pfeiffer: Spire very depressed, umbilicus broad.

v. **subcylindrica** Jeffreys: Spire elongated, apex obtuse, umbilicus narrow.

v. **antiqua** *Sowerby*[*]: *Spire elongated, apex not flattened. "Pleistocene of Grays and from the deposit at Kelvedon, Essex."*

v. **naticina** *Menke: Last whorl much inflated. Pleistocene, "rare at Crayford but was fairly common at Swanscomb." Living in Germany and Hungary, and there considered a good species.*[*]

v. **acuminata** Jeffreys: Spire much elongated, with pointed apex.

v. **pusilla** Miller: Shell small, four to four-and-a-half whorls, striæ stronger.

m. **sinistrorsum**: Shell sinistral.

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[*] See paper by Messrs. Santer Kennard and B. B. Woodward on the "Extinct Post-Pliocene Non-Marine Mollusca of the South of England," in the 10th vol. Trans. S.E.U. Sci. Soc. 1905.

VALVATA CRISTATA Müller. 57

Shell a flattened coil, thin, semi-transparent, glossy, with minute transverse striæ. Pale horn-colour. Whorls five, the body-whorl extremely large. Suture profound. Spire depressed, not raised above the level of the body-whorl. Aperture circular. Umbilicus very large, exposing the internal convolutions. Operculum circular, somewhat transparent, brownish horn-colour. Diameter 2 to 2·5 mill., height 1·75 to 2·25 mill. Animal grey or brownish, with black spots, foot-sole paler. The truly circular mouth provided with an operculum easily distinguishes it from a **Planorbis,** though there is a superficial resemblance.

HABITAT. Lakes, ponds, canals, and ditches.

v. alba Rowe: Shell white.

ASSEMANIA GRAYANA Leach.

=ASSIMINEA GRAYANA Leach.

Shell oval-conic, slightly translucent, fairly strong, smooth. Shining fulvous colour, with a dark band on the periphery of the body-whorl, which is continued spirally along the base of the upper whorls. Whorls seven, body-whorl very large, occupying nearly one half the shell. Suture simple, distinct. Spire quickly attenuated, apex acute. Umbilicus absent. Aperture ovate, peristome entire. Operculum ovate, horny. Diameter 6 to 6·5 mill., height 7 to 8 mill. Animal dark brown above, olivaceous below.

HABITAT. Brackish water in the estuaries of rivers, chiefly in the south-east of England.

POMATIAS ELEGANS Müller. 36

= CYCLOSTOMA ELEGANS Müller.

Shell oblong-conic or ovate, solid, opaque, striated strongly in the line of growth, more closely striated spirally. Yellowish-brown or pinkish, irregularly blotched with purple-brown. Whorls four-and-a-half, rapidly increasing, cylindrical, tumid. It is stated that the body-whorl is more tumid and voluminous in the female than in the male (Taylor's Monograph, vol. i, p. 26). Suture very deep. Spire produced, apex blunt, purplish. Aperture sub-rotund. Umbilicus narrow, not deep. Operculum spiral, pale horn-colour or brownish, solid. Diameter 8·5 to 10·5 mill., height 14 to 15 mill. Animal greyish-brown, dark brown below, mantle speckled with milk-white above.

HABITAT. Hedgerows and margins of woods, chiefly on calcareous soil in the southern counties of England.

v. **marmorea** Brown: Shell smooth, not striated.

v. **albescens** Des Moulins: Shell whitish, without bands and spots.

v. **ochroleuca** Moquin-Tandon: Shell yellowish, rather transparent, devoid of bands or marks.

v. **fasciata** Picard: Shell ash-colour, with two interrupted brown and violet bands.

v **pallida** Moquin-Tandon: Shell pale yellow with some spots and partly effaced bands.

ACICULA LINEATA Draparnaud. 21

=ACME LINEATA Draparnaud.

Shell minute, cylindrical, attenuated, glossy, strongly striated in the line of growth. Yellowish-brown or clear brownish-amber. Whorls six to seven, somewhat compressed, of moderate increase. Suture shallow. Spire blunt, apex obtusely rounded. Aperture rhombic-ovate, much contracted above, outer lip thin and reflected. Umbilicus minute. Operculum oval, very thin, horny, transparent. Diameter ·5 to ·75 mill., height 2 to 2·5 mill. Animal white, speckled with brown.

HABITAT. Decaying leaves, etc., in moist situations, chiefly near the sea in the south-west of England.

v. **alba** Jeffreys: Shell white, transparent.
m. **sinistrorsum** Jeffreys: Shell sinistral.

NERITINA FLUVIATILIS Linné. 46

Shell semi-globular, somewhat oval, solid, glossy, transversely dilated, distinctly striated longitudinally. Yellowish or brownish, variegated with white, purple-black or pink. Whorls three, the last one excessively large. Suture shallow. Spire short, obliquely depressed. Aperture transversely semi-lunar, large, occupying almost half of the lower surface. Operculum semi-lunar, tawny-yellow edged with red or orange, with a strong raised spire. Diameter 8 to 9 mill., height 4·5 to 5 mill. Animal white, tentacles marked with a longitudinal black line, foot spotted with black.

HABITAT. Attached to stones in canals and rivers. The most solid of our freshwater shells.

- v. **cerina** Colbeau: Shell uniformly straw-colour.
- v. **trifasciata** Colbeau: Shell with three dark spiral bands.
- v. **undulata** Colbeau: Shell with some dark transverse bands.
- v. **nigrescens** Colbeau: Shell blackish.

NERITINA GRATELOUPIANA Férussac.

Shell solid, semi-globular, transversely dilated, glossy, marked with very dark brown zigzag or flame-shaped lines alternating with white ones. Whorls three, the last one excessively large. Spire short, obliquely depressed. Aperture transversely semi-lunar, large. Columella large, depressed, irregularly folded, rugulose, often dichotomously crenulated. Diameter 9 mill,. height 5 mill.

HABITAT. *Extinct in Britain, occurring in Pleistocene gravels at Swanscombe, Kent. On the Continent it occurs only in beds of the Upper Miocene.*

DREISSENSIA POLYMORPHA Pallas. 29

Shell triangular, sharply keeled in the centre of both valves, flattened below, solid. Olive-brown marked above transversely with flexuous or zigzag streaks of purple-brown or chocolate colour. Umbones anterior, small, incurved. Ligament long and narrow. Hinge toothless, strong, provided with a hollow triangular plate beneath the umbones. Anterior margin almost straight, lower margin incurved. Length 36 to 40 mill., width 20 to 26 mill. Animal blackish, foot white, except the grooved part near the byssus which is pale yellow.

HABITAT. Canals, rivers, and lakes. A naturalised alien, first recorded as a British species in 1824.

v. **augusta** Colbeau: Shell narrow, very compressed.

v. **dilatata** Colbeau: Shell broad and flat, the beaks protruding beyond the hinge.

UNIO PICTORUM Linné. 29

Shell ovate-oblong, wedge-shaped, tumid, solid, glossy. Greenish towards the posterior margin, otherwise greenish-yellow, marked with brown in the lines of growth. Umbones fairly prominent, not so rugose as in Unio tumidus. Ligament parallel with the lower margin. Anterior side rounded, posterior side forming a blunt truncated beak. Anterior teeth arched, much compressed, crenated. Posterior teeth in the left valve small or wanting. Length 70 to 85 mill., width 30 to 35 mill. Animal greyish. Narrower in proportion to its size, more glossy, less solid and of a brighter green colour than U. tumidus.

HABITAT. Ponds, lakes, and sluggish rivers.

v. **curvirostris** Normand: Shell posteriorly cuneate, olive-colour, smaller, shorter, and bent.

v. **latior** Jeffreys: Shell yellowish-brown, broader and shorter.

v. **compressa** Jeffreys: Shell broad and flat, greatly compressed and attenuated posteriorly, assuming a beak-like form. Upper margin raised and curved, lower margin straight.

v. **radiata** Moquin-Tandon: Shell yellowish, with well marked green rays.

v. **platyrhynchoidea** Dupuy: Posterior end much produced and greatly flattened, lower margin sinuate. Usually found in flowing waters (see Taylor's Monograph, vol. i, pp. 53 and 63).

UNIO TUMIDUS Retzius. 24

Shell ovate-oblong, wedge-shaped, tumid, solid, fairly thick, not so glossy as U. pictorum. Brown frequently tinged with green in the lines of growth. Periostracum smooth. Umbones prominent, rugose, excentric. Lunule lanceolate and narrow. Ligament short, thick, prominent, not parallel with the lower margin but if produced forming an angle to it. Anterior side rounded, posterior side produced and wedge-shaped. Anterior teeth high, strong and conical. Length 70 to 85 mill., width 30 to 35 mill. Animal greyish, mantle bordered with brown.

HABITAT. Canals, ponds, and sluggish rivers.

v. **mulleri** Rossmässler: Shell more oval.

v. **ovalis** Montagu: Shell somewhat inequivalve, wedge-shaped, dark olive-brown, Anterior side abruptly truncate, broader. Lunule oblique, broad and deep.

v. **ponderosa** Pascal: Shell large, dark brown, and very solid.

v. **radiata** Colbeau: Shell thin, periostracum greenish with yellow rays interrupted by transverse yellow bands, hinge line almost straight, posterior side very compressed above.

UNIO LITTOARLIS Lamarck.

Shell oblong-ovate, wedge-shaped, much inflated, anterior side very short and terminating rather abruptly, solid, brownish, smooth or with shallow lines of growth. Umbones obtuse. Anterior side arcuate, posterior side attenuated, base a little concave. Length 60 to 65 mill., width 30 to 38 mill.

HABITAT. *Extinct in Britain, occurring only in Pleistocene deposits.*

UNIO MARGARITIFER Linné. 24

Shell oblong, thick, heavy, very solid, somewhat compressed, strongly striated in the line of growth. Uniformly dark brown. Umbones excentric, incurved, often more or less eroded. Lunule narrow and indistinct. Ligament very long. Anterior side rounded, posterior side gradually sloping, obtusely keeled above, margin rounded, lower margin straight, hinge strong. Cardinal teeth small, thick, sub-triangular-conic, slightly compressed. The posterior tooth in the left valve is much developed. Length 100 to 140 mill., width 50 to 65 mill. Animal dirty grey, sometimes reddish.

HABITAT. Amongst stones and gravel in the shallow parts of quick running rivers in mountainous districts.

- v. **sinuata** Lamarck: Shell yellowish-brown, proportionately broader, lower margin incurved towards the middle.
- v. **roissyi** Michaud: Shell but slightly arched above, not sinuous below, and larger posteriorly.

ANODONTA CYGNÆA Linne. 50

Shell equivalve, ovate, thin, glossy, compressed at first, becoming ventricose with age. Dull green, more or less dusky, and slightly radiated. Umbones small, convex, lunule indistinct, hinge line straight, ligament long. Anterior side rounded, abruptly sloping downwards, posterior side truncated, compressed above. Pearly and iridescent within. Length 120 to 170 mill., breadth 60 to 90 mill. Animal grey or reddish-grey. The largest of our native Unionidæ.

HABITAT. Lakes, ponds, canals and sluggish rivers.

- v. **anatina** Linne: Shell smaller, elliptical-oval, much compressed, thick. Ligament short. Posterior side sloping obliquely to a wedge-shaped point. Often described as a distinct species.
- v. **arenaria** Schröter: Shell broader, upper and lower margins almost parallel.
- v. **rostrata** Rossmässler: Shell oblong-oval, upper margin with a slightly raised and curved dorsal crest. Posterior side ending in a long curved wedge-like point.
- v. **stagnalis** Sowerby: Shell thin, inflated, hinge-line arcuate, basal line much rounded. Olive-green.
- v. **incrassata** Sheppard: Shell solid, very ventricose, upper margin slightly curved on the posterior side. Olive-green.
- v. **radiata** Müller: Shell very large. Greenish with yellow rays.
- v. **pallida** Jeffreys: Shell light yellow or fawn colour. Lower margin rounded, posterior side attenuated as in var. rostrata.

CORBICULA FLUMINALIS Müller.

=Cyrena fluminalis Müller.

Shell roundly-triangular or rounded-ovate, thick. glossy, strongly and regularly ribbed concentrically. Olive-yellow externally, violet within. Ligament short, very prominent. Cardinal teeth sharp and separated by deep grooves. Lateral teeth very long. Length 21 mill., width 21 mill., thickness 14 mill.

HABITAT. *The banks of the Lower Nile, through Syria in a northerly direction to Transcaucasia and the Caspian Sea, eastwards to Turkestan, Afganistan and Cashmere. In Britain, occurring only in the Pleistocene deposits of the Thames-Rhine system. Mr. B. B. Woodward remarks "What led to the extinction of this interesting species that once had a wide range over Northern Europe and Asia, remains to be explained. That it bred in this country is certain, the shells of fry being found, as well as individuals of all sizes" (Pleistocene Non-Marine Moll. Lond. Dist., Proc. Geol. Assoc., vol. xi, no. 8).*

SPHÆRIUM RIVICOLA Leach. 24

Shell oval-globose, strong, opaque, glossy, valves marked with elevated concentric striæ which usually become obsolete in the umbonal region. Brownish-green or yellowish horn-colour. Umbones tumid, obtuse, usually paler than the rest of the shell. Ligament distinct, slightly projecting. Hinge strong, with a double cardinal tooth in each valve, two lateral teeth of a triangular shape in the right valve, and four teeth in the left. Length 21 mill., width 15 mill., thickness 10 to 11 mill. Animal greyish, siphons tinged with rose, foot and mantle white.

HABITAT. Sluggish rivers, streams, and canals.

v. flavescens Moquin-Tandon : Shell yellowish.

SPHÆRIUM CORNEUM Linne. 88

Shell sub-orbicular or globular, moderately thin, opaque, glossy, finely and evenly striated concentrically, faintly striated from umbones to the margin. Brownish or yellowish-brown. Umbones broad, obtuse, almost central. Ligament short, depressed, almost imperceptible. Hinge strong, teeth as in Sphærium rivicola. Length 13 mill., breadth 8 to 9 mill., thickness 7 to 8 mill. Animal whitish, siphonal tubes tinged flesh-colour.

HABITAT. Rivers, canals, ponds, and ditches.

v. **pisidioides** Gray: Shell sub-triangular, posterior side more produced, with coarse concentric striæ.

v. **scaldiana** Norman: Shell ovate, paler.

v. **nucleus** Studer: Shell smaller, nearly spherical.

v. **flavescens** Macgillivray: Shell smaller, more globular and paler.

v. **mænana** *Kobelt: Valves constricted. Pleistocene at Crayford and Ilford.*

SPHÆRIUM LACUSTRE Müller. 50

Shell sub-rhomboidal, elliptical, much compressed, fragile, thin, regularly striated concentrically. Greyish ash-colour or yellowish-white. Umbones central, narrow, very prominently capped with the nucleus of the shell. Ligament small, inconspicuous. Hinge strong, furnished with cardinal and lateral teeth as in the preceding species, but proportionately smaller and shorter. Length 9 to 10 mill., breadth 7 to 7·5 mill., thickness 4 to 5 mill. Animal white, siphons slightly rose-colour. Very distinct in the prominent umbones.

HABITAT. Lakes, ponds, and canals.

v. **ryckholti** Normand: Shell smaller, triangular and globose, umbones remarkably prominent.

- v. **rotunda** Jeffreys: Shell yellowish-green, rounder, more compressed.
- v. **brochoniana** Bourguignat: Shell very large, compressed. Umbones small.
- v. **ovalis** Férussac: Shell somewhat oval, umbones slightly projecting.

SPHÆRIUM PALLIDUM Gray. 9

non SPHÆRIUM OVALE Férussac.

Shell oblong, compressed, faintly striated concentrically, thin,·fragile. Pale grey or yellowish. Anterior side rounded, posterior side truncated, sloping towards the lower margin. Umbones small, almost central not very prominent. Ligament long and narrow, easily discernible. Hinge line straight anteriorly, incurved anteriorly. Cardinal teeth extremely minute, two lateral teeth of triangular shape in the right valve, four teeth in the left valve. Length 13 to 13·5 mill.. breadth 10 mill., thickness 6 to 6·5 mill. Animal white.

HABITAT. Ponds and rivers. Local. Has been recorded from Surrey, Middlesex, Warwick, Stafford, Cheshire, Lancashire, and Yorkshire.

PISIDIUM AMNICUM Müller. 39

Shell sub-triangular, more or less obliquely subovate, extremely inequilateral, moderately ventricose in the adult, compressed when young (a feature which serves to distinguish young specimens from P. subtruncatum), deeply grooved concentrically, thin, fragile, glossy, semi-transparent. Whitish-grey or pale brown. Umbones slightly produced, placed anteriorly. Ligament short, inconspicuous. Anterior side almost symmetrically rounded, posterior side short, upper corner sub-angulated. Cardinal teeth double in each valve, lateral teeth two in each valve, the posterior being the stronger. Length of shell 8 to 8·5 mill., width 6 to 6·75 mill., thickness 5 to 5·45 mill. The largest representative of the genus.

HABITAT. Lakes, ponds, rivers, and canals.

v. **flavescens** Moquin-Tandon: Shell uniformly pale yellow.

v. **læviuscula** Moquin-Tandon: Shell very large, concentric wrinkles demi-effaced.

v. **danubialis** *Bœttger: Shell very large and ventricose, strongly striated. Pleistocene at Grays and Crayford.*

PISIDIUM SUPINUM A. Schmidt.

=Rivulina supinum, A. Schmidt.

Shell sub-triangular, solid, ventricose, anterior side delicately striated transversely, posterior side slightly so. Whitish-grey or ash-colour in recent specimens. Umbones acuminate. Ligament short. Cardinal teeth double in each valve, the posterior being smaller and thinner Lateral teeth two in each valve, the anterior ones strong and well developed, posterior usually close together. Length of shell 4 mill., width 3·5 mill., thickness 3 mill.

HABITAT. *Muddy pools, rarely in running water, in Germany, Holland, Sweden, etc. In Britain occurring in many Pleistocene and Holocene deposits. "Recorded by Sandberger as living in Scotland. We have been unable to obtain any confirmation of this, though it is not improbable that it may yet be found living in these islands"* (Messrs. Kennard and Woodward in Trans. S. E. Union Sci Soc. 1905, p. 22).

PISIDIUM ASTARTOIDES Sandberger.

=Fluminina astartoides, Sandberger.

Shell sub-triangular, solid, strongly grooved concentrically, the grooves with faint transverse striæ. Lines of growth always equidistant. Umbones wide, depressed, sub-median. Ligament short, fairly broad. Cardinal teeth double in each valve, the posterior ones always thinner. Lateral teeth dissimilar, the lower obtusely triangular, projecting, the upper conspicuous in the right valve, small and obtuse *in the left. Length 9 mill., width 7 mill., thickness 5 mill. It may be distinguished from P. amnicum by the equidistant lines of growth, they are never fainter and closer at the umbo, as is usually the case in that species.*

HABITAT. "*It is not met with except in the River Drift, and in association with Corbicula fluminalis, no example being quoted from the Alluvium or known living.*" (B. B. Woodward, 'Pleistocene (non-marine Moll. London District.' Proc. Geol. Assoc., vol. xi, 8, 1890.)

PISIDIUM HENSLOWIANUM Sheppard.

Shell sub-triangular, obliquely oval, ventricose, with regular and well-defined concentric grooves, glossy, thin. Yellowish horn-colour. Umbones rather acute, appearing tubercular, remarkable in being provided with a lamelliform projection "appearing like a ridge rising up vertically on either side of the hinge, but in the young looks like a small wing proceeding from the middle of the shell."* Anterior side produced, posterior side blunt, rounded below, sub-angulated above. Teeth as in P. amnicum, but the cardinal teeth do not form an inverted V. Length of shell 4 to 6 mill., width 4 to 4·5 mill., thickness 2 to 2·5 mill.

HABITAT. Ponds, ditches, and slow running streams.

PISIDIUM SUBTRUNCATUM Malm. 79

=PISIDIUM FONTINALE Jeffreys.

Shell sub-triangular, tumid, thin, with fine concentric striæ. Greyish-white or pale ash-colour. Umbones prominent, obtuse, placed anteriorly. Ligament short, very small. Hinge with teeth as in P. amnicum, but the cardinal teeth do not form an inverted V. Anterior side abruptly truncated, posterior side rounded. Length of shell 3·5 to 4·5 mill., breadth 3 to 3·75 mill., thickness 2 mill.

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*Forbes and Hanley 'History of Brit. Moll.' vol. ii, p. 132.

HABITAT. Sluggish streams, canals, ditches, and ponds.

v. **pallida** Gassies: Shell very tumid, pale, irregularly striated, with dark lines radiating from the umbonal region.

PISIDIUM PULCHELLUM Jenyns.

Shell sub-triangular, thin, glossy, finely and regularly striated concentrically, very ventricose. Whitish-grey. Umbones not very prominent, pointed, placed almost central, Ligament short and scarcely visible. Hinge short and strong. teeth similar to those of the preceding species, Anterior side truncated, rounded, posterior side slightly produced, rounded. Length of shell 4 to 4·5 mill., width 4 mill., thickness 1 to 1·5 mill. The smallest member of the genus

HABITAT. Lakes, ponds, rivers, and canals.

PISIDIUM PUSILLUM Gmelin. 84

=PISIDIUM FONTINALE Draparnaud, of Continental authors.

Shell oval, slightly inequilateral, slightly compressed, thin, semi-pellucid, somewhat dull, finely and regularly striated concentrically. Uniformly yellowish-white or pale horn-colour. Umbones short, obtuse, nearly central. Ligament short, invisible from the exterior. Hinge short and strong, with teeth as in P. amnicum, but the cardinal teeth do not form an inverted V. Anterior side very rounded, posterior side sloping gradually downwards. Length of shell 3·5 to 4 mill., breadth 3 mill., thickness 1·75 to 2 mill.

HABITAT. Ponds, ditches, and marshes.

v. **cinerea** Alder: Shell more compressed, striæ indistinct, glossy, greyish ash-colour.
v. **grandis** Adams: Shell very large.

PISIDIUM NITIDUM Jenyns. 38

Shell sub-orbicular, or slightly oval, thin, ventricose above, compressed below, always very glossy and but rarely coated with mud, finely and regularly striated concentrically, with a few deep grooves in the umbonal region. Umbones obtuse and sub-central. Ligament short, not visible from the exterior. Hinge and teeth as in P. amnicum, but the cardinal teeth are not arranged like an inverted V. Length of shell 3 to 3·5 mill., breadth 3 mill., thickness 2 mill.

HABITAT. Lakes, ponds, and pools.

v. **globosa** Adams: Shell sphæroidal.
v. **splendens** Moquin-Tandon: Shell lemon-colour.

PISIDIUM OBTUSALE Pfeiffer.

Shell rounded-oval, slightly oblique, very slightly inequilateral, very tumid, as broad as long, very minutely striated concentrically, pellucid, thin, glossy. Dusky ochraceous, margined with an orange-coloured zone. Umbones slightly prominent, tumid, obtusely rounded. Posterior less angular than in P. pusillum. Length of shell 3 to 3·5 mill., breadth 3·5 mill., thickness 2 to 2·25 mill. Smaller and more ventricose than P. pusillum, which it somewhat resembles.

HABITAT. Shallow ponds and ditches. Rare.

v. **hibernica** Westerlund: Shell very globular, equal in breadth, length, and height, thin, of a yellowish-green colour. Found by Dr. Scharff in Lough Nagarriva, above Glengariff, in County Cork. (See 'Irish Naturalist,' Dec. 1895, p. 335, with figures and Dr. Westerlund's description).

PISIDIUM GASSIESIANUM Dupuy. 48

=PISIDIUM ROSEUM Jeffreys, non Scholtz.
=PISIDIUM MILIUM Auctt, non Held.

Shell somewhat oblong, tumid, thin, glossy, deeply and regularly striated concentrically. Yellowish-white or pale horn-colour. Umbones very excentric, prominent, obtuse. Ligament almost invisible. Teeth as in preceding species but smaller. Anterior side truncate, abruptly sloping downward, posterior side produced and rounded. The lower border is almost straight. Length of shell 3·5 to 3·75 mill., breadth 2·75 to 3 mill., thickness 2 mill. Somewhat resembling P. nitidium, but very distinct in its oblong shape and excentric umbones.

HABITAT. Ponds and pools.

v. **alpestris** Clessin: very ventricose, and very strongly striated, lower margin somewhat arched towards the posterior extremity.

ADDENDA.

page 48. Helix nemoralis variety albolabiata, von Martens. Peristome and rib whitish.

page 61, to follow Jaminia muscorum. The species described below has been recently added to our native mollusca by Dr. G. W. Chaster (J.C., vol. xi, p. 267, January 1906).

JAMINIA TRIPLICATA Studer.

Shell ovate, cylindrical, minutely striated. Chestnut-brown or dark horn-colour. Whorls seven, body-whorl one third of the entire length. Suture well defined. Spire short, apex blunt. Aperture semi-circular, provided with a white external rib, usually tridentate. The columellar tooth is somewhat more deeply seated than in J. muscorum. The tooth at the base of the penultimate whorl is very pronounced, forming a short ridge which, under certain aspects, appears duplicated. Umbilicus narrow. Diameter 1·5 mill., height 2·75 to 3 mill. The species is closely allied to J. bigranata, Rossmässler (J. muscorum v. bigranata, p. 71). J. bigranata is always larger (diameter 1·75 to 2 mill., height 3·5 to 4 mill.), and the tooth at the base of the penultimate whorl is never more than a tubercular denticle.

HABITAT. Amongst grass growing in the hollows that represent the filled-in flint pits on the chalk uplands near Brandon in Suffolk.

v. **bidentata** Studer: Columellar tooth absent.

[We have to thank Dr. Chaster for very kindly loaning his original specimens, and for note as to habitat.]

page 65.

VERTIGO LILLJEBORGI.

A note on the re-discovery of this species by Messrs. Chaster and Tomlin in Gwyn Jeffreys' locality for it, escaped our notice when copying Jeffreys' original description. This species and Vertigo moulinsiana "have a wholly different facies, although the general shape is similar. V. lilljeborgi has a blunter apex and a much shorter body-whorl in proportion to its size; it is darker in colour, and much more glossy; the umbilicus is less open, and the size is uniformly smaller by about half a millimetre in height, and a quarter in breadth. At first acquaintance one was inclined to confuse it, not with V. moulinsiana, but with V. antivertigo; it has, however, a much blunter apex than the last-named species, and the teeth are quite different, being normally four in number." (Messrs. G. W. Chaster and Brocton Tomlin in the 'Irish Naturalist,' Jan. 1903.)

page 107.

Vivipara contecta Millet, m. sinistrorsum (J.C., vol. xi, p. 224.)

ERRATA.

page 1	Fourth line from bottom, "preceeding" should be "preceding."
page 14	Ditto.
page 20	Sixth line from top, for "later" read "latter."
page 39	Acanthinula aculeata, Müller. According to the Census this species occurs in 63 counties.
page 45	Fourth line from bottom, for "Manhull" read "Marnhull."
page 48	Sixth line from bottom, "umbiticus" should be "umbilicus."
page 54	Opeas clavulus. "Apparently an error has been made in including" should read "Apparently an error has been made in considering," etc.
page 58	Jaminia secale, Draparnaud, occurs in 19 counties.
page 61	Jaminia muscorum v. bigranata, Rossmässler, should be excluded. (See J.C., April 1906, page 320.)
page 75	Succinea oblonga. "Diameter 2 to 4 mill., height 6 to 8 mill,' should read "Diameter 2 to 5 mill., height 6 to 10 mill."; specimens collected by Dr. Chaster on the shores of Lower Lough Erne are 5 by 10 mill.
page 78	Ninth line from bottom, "parietel" should be "parietal."
page 92	"Planorbis cristata" should read "Planorbis crista."
page 116	"Unio littoarlis" should read "Unio littoralis."

In all cases "Linne" should be "Linné," and "Muller" should be "Müller."

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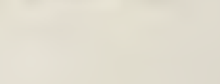

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